ARCHITECTURE DEPARTMENT

MASTER OF ARCHITECTURE PROGRAMME

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2010-2011 DESIGN REPORT

LAPUTA: CITY PLANNING ON THE WATER

PANG Ho Yin, Dennis May 2011


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Thesis

LAPUTA

City Planning On The Water

Name
Den Hy Pang

Thesis Advisor:
Tsou Jin Yeu

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Research

00 Introduction

01 Fundamental issue

02 Research Study

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Thesis Statement

Because of the Global Warming effect, the sea water level raised dramatically in the recent years. The Sea takes away lots of the land from us, which is already very limited on earth. We are trying to get back the land, we have reclamation, we built the dam, we fight against the sea. But, we lost even more during the reclamation. The only solution is to coexist with the sea, to live with the sea. Then, Floating cities appear.

Global Warming

The average temperature of the earth is raised yearly, because of the green house effect, global warming phenomenon. As a result, the sea water level is raised yearly, too. In the past, the sea water raised in a mean rate of 1.8mm per year, and more recently at rates estimated near 2.8 ± 0.4 to 3.1 ± 0.7mm per year (1993–2003). In 2007, the Intergovernmental Panel on Climate Change's Fourth Assessment Report (AR4) predicted that by 2100, global warming will lead to a sea level rise of 180 to 590 mm depending on which of six possible world scenarios comes to pass, and barring rapid dynamical changes in ice flow. More recent research, which has observed rapid declines in ice mass balance from both Greenland and Antarctica, finds that sea-level rise by 2100 is likely to be at least twice as large as that presented by IPCC AR4, with an upper limit of about two meters.

Diagram 1-1 World Sea water rise level

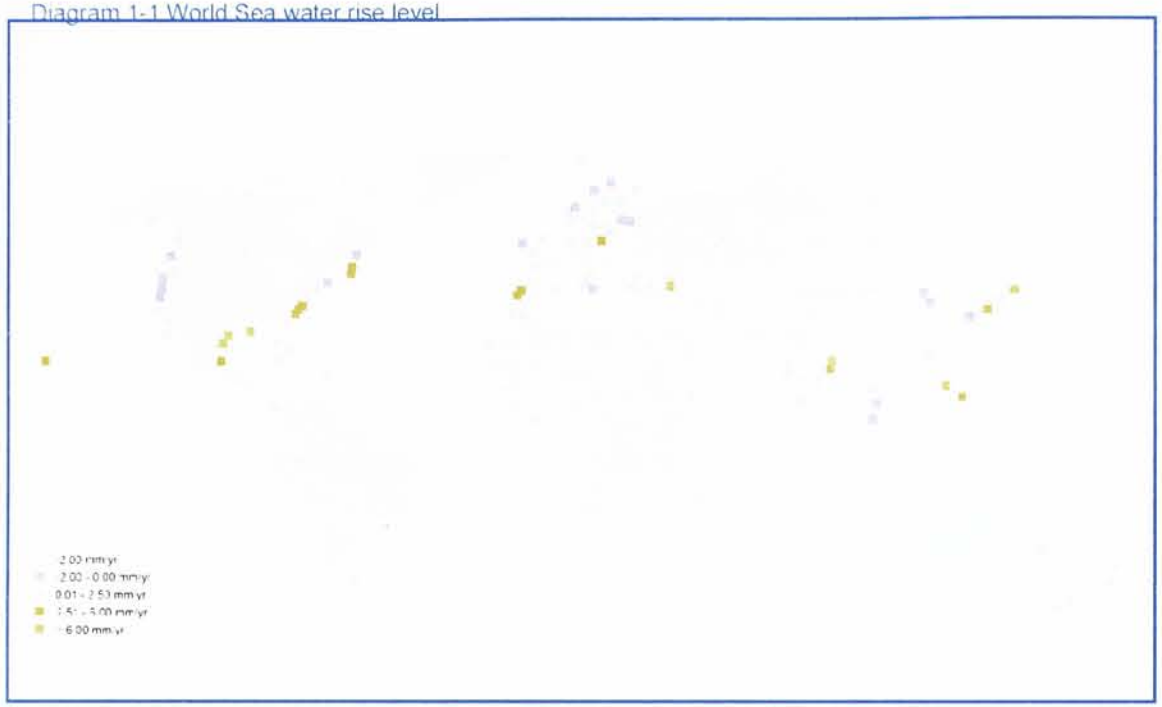
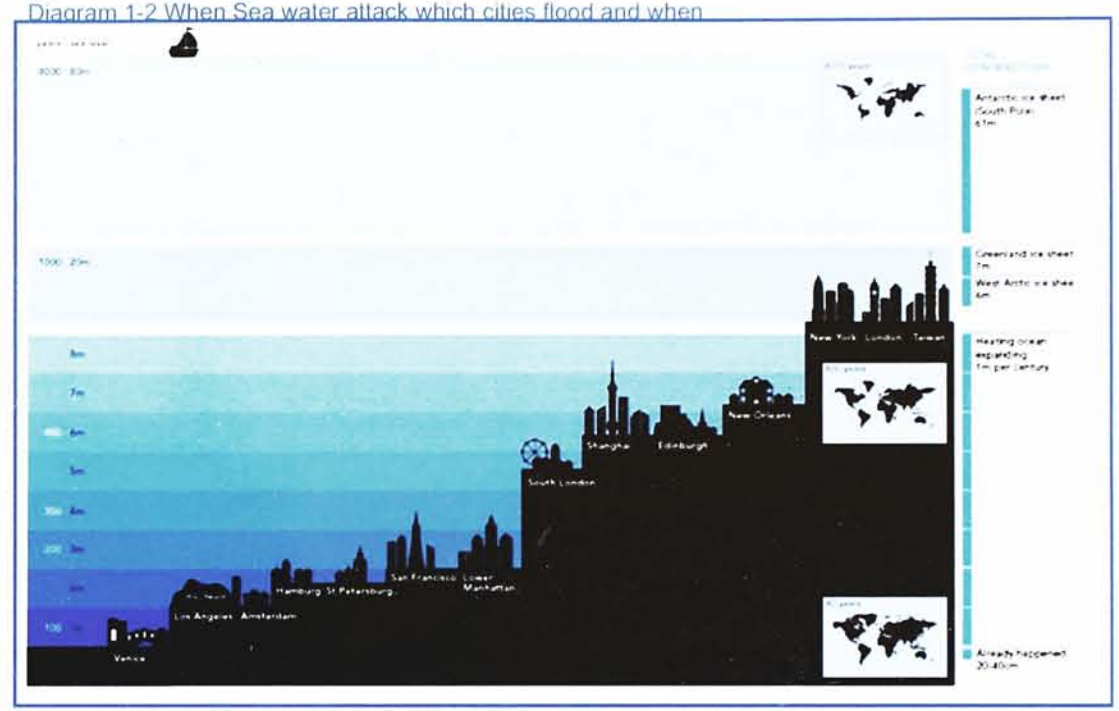


Diagram 1-2 When Sea water attack which cities flood and when



Sinking City

Different district/ cities in the world have different rate of the rise of the sea water level. North America, Europe, East Asia which have the highest density and population become the most serious district.

Venice

When the sea water rises 1m, Venice will be then under the sea. After that, Los Angeles, Amsterdam, Hamburg , St. Petersburg will all under the sea when the sea level increase by 2m. When the sea water continuous raised, South London, ShangHai, Edenburgh, New Orlena, New York will all disappear in the near future.

Amsterdam

According to the simulations of different low-land cities when the sea water increase by 1m, most parts of Venice, Netherland , Dubai will be covered by the sea water. The important things is the sea water increased by 1m was not the things will be happened in 1 million later, but it will occur only in100 years or closer

Diagram 1-3 The Flooding Map of Venice by 1m

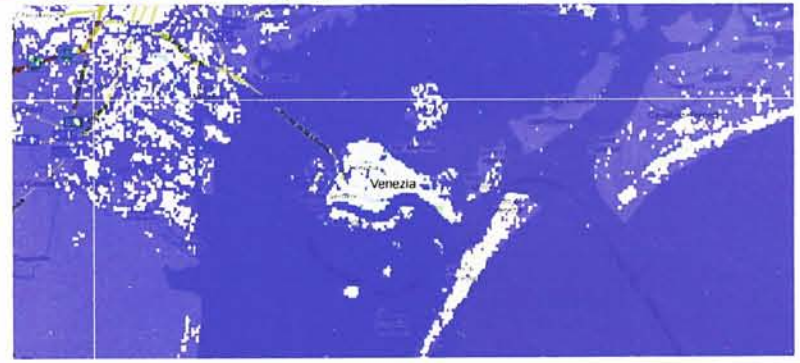


Diagram 1-4 The Flooding Map of the Netherlands by 1m

Area of reclaimed land in the world

Approximately 71% of the Earth's surface (~3.61 x 1014 m2)is covered by ocean, There are no sufficient land for human to live or develop in the present. The creation of new land was for the need of human activities. There are several examples in the world, such as The Netherlands, parts of New Orleans, and the artificial island, such as Kansai international airport, Palm island in Dubai, etc. Reclamation can give back the land to human , but on the other hand, it take away something, Draining wetlands for ploughing, for example, is a form of habitat destruction. In some parts of the world, new reclamation projects are restricted or no longer allowed, due to environmental protection laws.

Diagram 1-5 The artificial island in Dubai

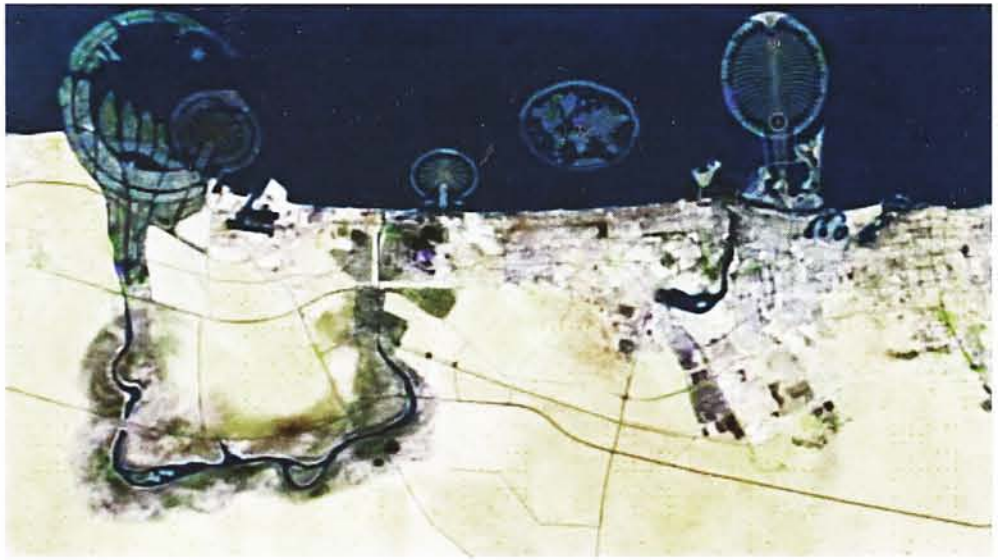
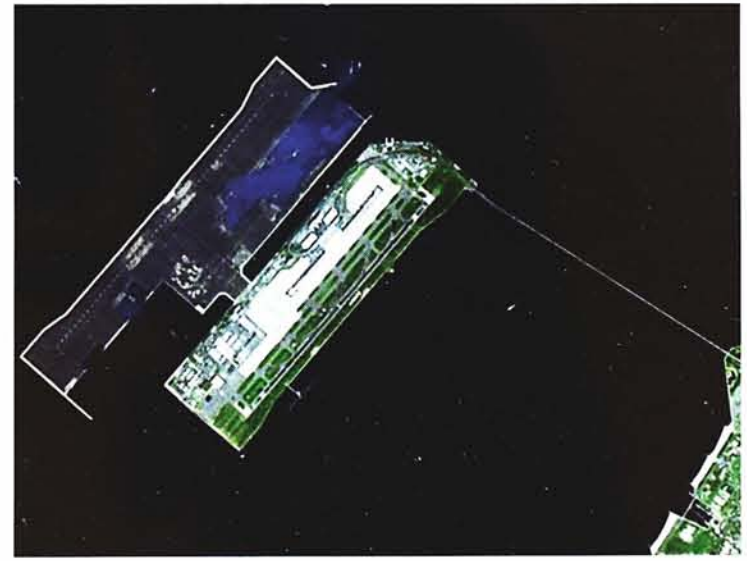


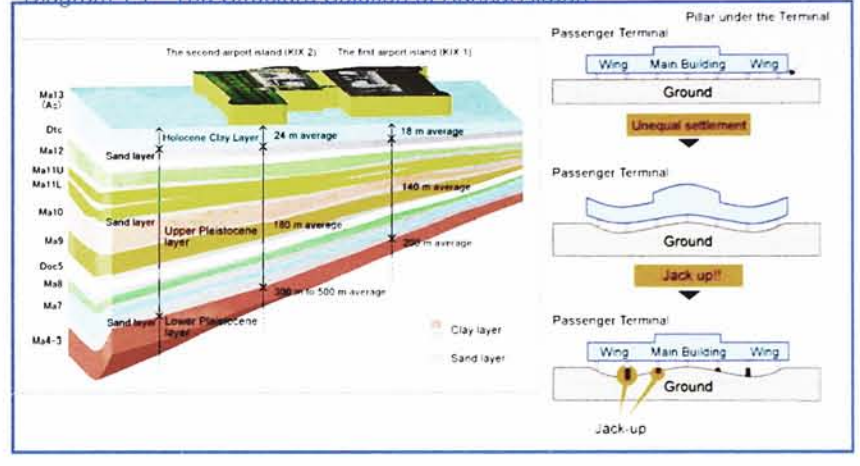
Diagram 1.6 Kansai Internation airport in Japan



The influence after reclamation

Reclamation not only damage the environment, it also costs a lot. For an example, the artificial island of Kansai International airport spend a lot. Not only the construction fee, but the maintenance fees are also in a very huge amount. The island had been predicted to gradually sink as the weight of the material used to construct the island would cause it to compress downwards. However, by this time, the island had sunk 8m, much more than predicted. The project then became the most expensive civil works project in modern history after twenty years of planning, three years of construction and several billion dollars of investment.

Diagram 1-7 The Structure Solution of Kansai Airport



Population Distribution In The World

As of 14 October 2010, the world population is estimated by the United States Census Bureau to be 6.875 billion. According to the diagram 2.11, 2.12, 2.13, we can notice that the coastal cities/area will have a higher population then others. Since the anicent period, human were like to live with water. The anicent Chinese all were found near the water resource, like river, coast, lake, etc. Beside high population in coastal cities, the coastal cities always are richer than the in-land cities. Because of both the high density of population and the higher economic potential ability, the coastal cities always see as a very important cities and have a higher potential to develop. Such as Hong Kong, ShangHai, Amsterdam, Tokyo, etc.

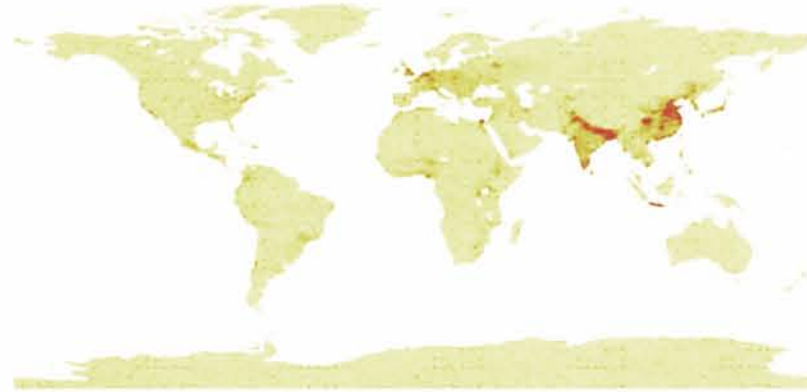
Limitation of the Development in Coastal Cities

But because of the limitation of the geography, or in order words, the water resources blocked the development of the cities, the cities always developed in a uneven urban form, therefore, the linkage within the cities are very weak.
On the other view, people are more willing to live near the water. Investigate a new living style/method live near the water are much more worth than live near the mountain or in land.

Diagram 1-9 The world population by countries

Diagram 1-8 Cities with population of 1 million

Diagram 1-10 The world population distribution

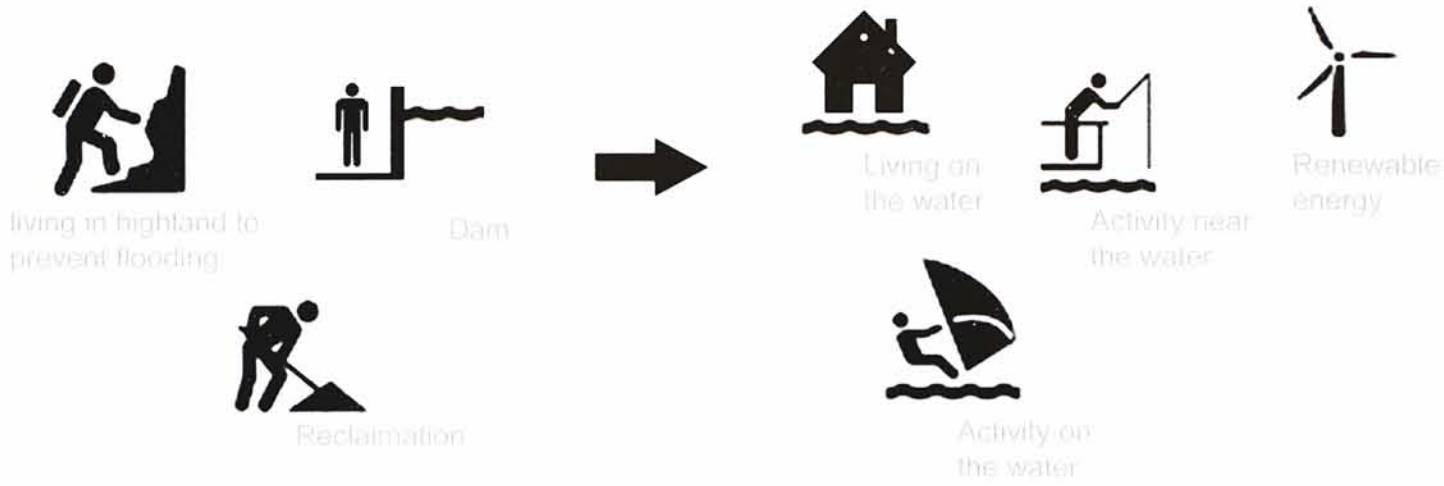


Attitude

To solve the issue, the attitude should not fight against with the sea, but we should co-exist with the Sea, We are not going to take the land from the sea, on the other hand we should give back the land to the sea

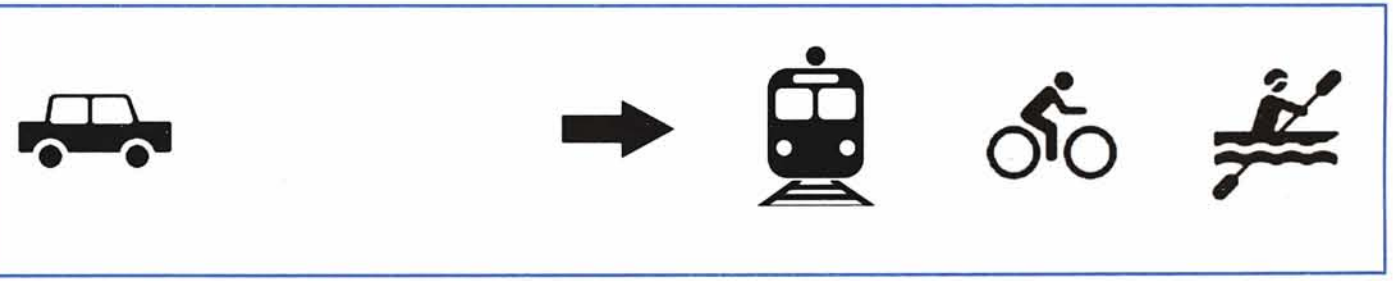
Not rescue project

It is not a rescue project, It is not saying that the project can save the people sinking in the water.
It is about changing of living style, aim at a more comfortable living space.
People can much easier to access to the water resources. As the same time, changing their attitude towards the sea, not fight against the sea, but co-exist with the sea.


living in highland to prevent flooding
Dam
Living on the water
Activity near the water
Renewable energy
Reclaimation
Activity on the water

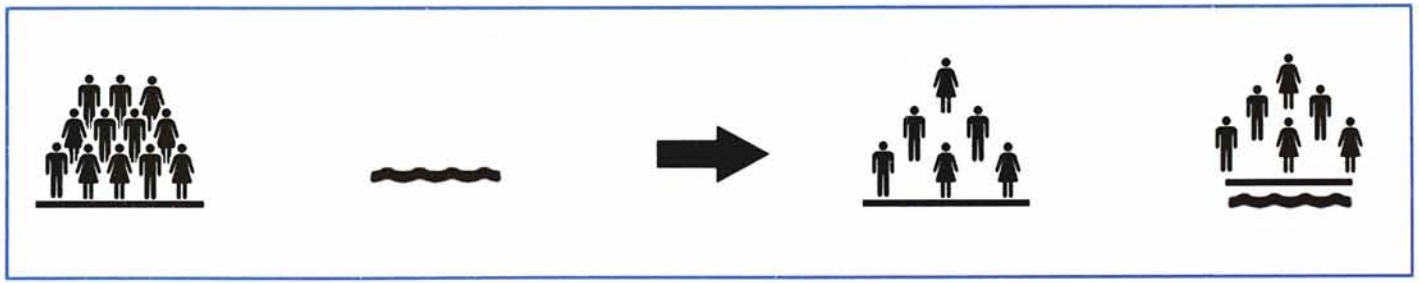
Bicycle/ mass transport instead of private car

In the future cities, private car should not appear in our living community, if we want to have a green, low carbon city Instead, mass traffic system, railway system, slow traffic, etc should appear in the community.



High density to Low density

We should be re-distribute the density in the future. We should not concentrate the population on the land, instead, we should make good use of the surface of the water, distribute the population density both on the land and on the water.



Palm Islands

The Palm Islands are artificial islands in Dubai, United Arab Emirates on which major commercial and residential infrastructure will be constructed. Each settlement will be in the shape of a palm tree, and will have a large number of residential, leisure and entertainment centers. The first tw islands will comprise approximately 100 million cubic meters of rock and sand. Palm Deira will be composed of approximately 1 billion cubic meters of rock and sand. Among the three islands there will be over 100 lucury hotels, exclusive residential beach side villas and apartments, marinas, water theme parks, restaurants, shopping malls, sports facilities and health spas.

Location Dubai, United Arab Emirates
Contractor Nakheel Properties, Belgian and Dutch dredging and marine contractor Jan De Nul and Van Oord, some specialists in land reclamation.
Area Palm Deira 46.35 km^2
Contruction begin/ period 2001/10-15 years

Marine City

Kikutake is most well known for his 'Marine City' project of 1958, which formed part of the Metabolist Manifesto launched at the World Design Conference in Tokyo in 1960 under the leadership of Kenzo Tange.

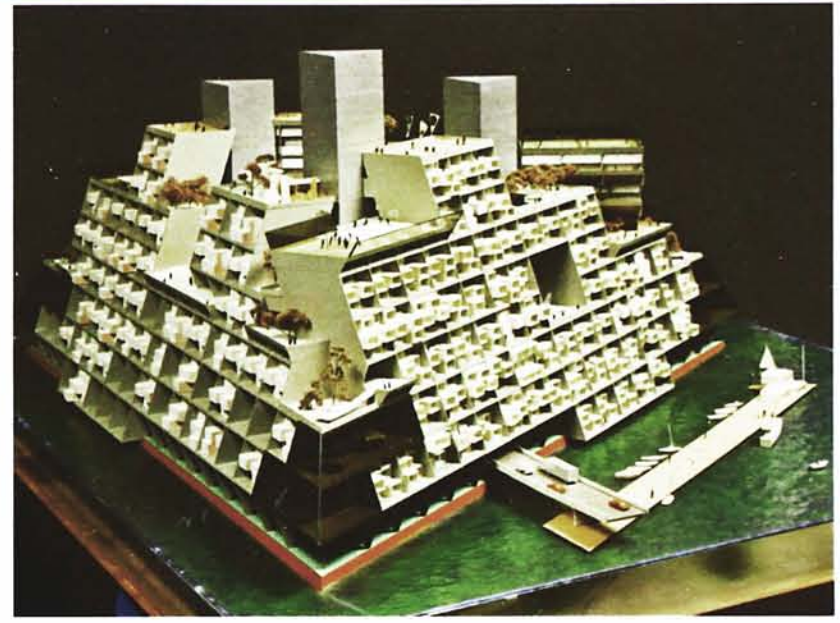
Location Unabara, Japan
Total Site Area (2D) 198,849,635m^2
Total Greenspace 609,775m^2
Area of Water 88,525,632m^2
Area of Infrastructure 107,179,167m^2
Total Built Area 2,535,061m^2
Total Population 500,000
Density 2,514 people/km^2
Project Year 1960
Architect Kiyonori Kitutake

Kiyonori Kikutake's Ocean City was a Metabolist proposal for a floating city of two concentric rings. The inner ring is reserved for residential uses, the outer is designated as an industrial zone, and the innermost islands are to be used for communal purposes. The area between the rings is reserved for the cultivation and production of special seaproducts, while the meeting point of the rings provide a space for a communal adminstration and planning center. The city is governed by a control tower, that provides artificial sunlight to the whole city; new towers are set up as the city expands with each tower acting as a nucleus. Mova blocks compose the housing in the Ocean City, with each housing unit as an exchangeable circular house that can revolve around the core. At 100m high, each tower houses 10,000 people.

Buckminster Fuller was an American engineer, author, desgner, inventor, and futurist. He also developed numerous inventions, mainly architectural designs, the best known of which is the geodesic dome.

Location Tokyo, Japan
Total Site Area 4,486,024m^2
Total Greenspace 2,768,724m^2
Area of water 0m^2
Area of Infrastructure 366,366m^2
Total built Area 4,600,556m^2
Total Population 1,000,000
Density 222,915 people per km^2
Architect Buckminster Fuller
Project Year 1965

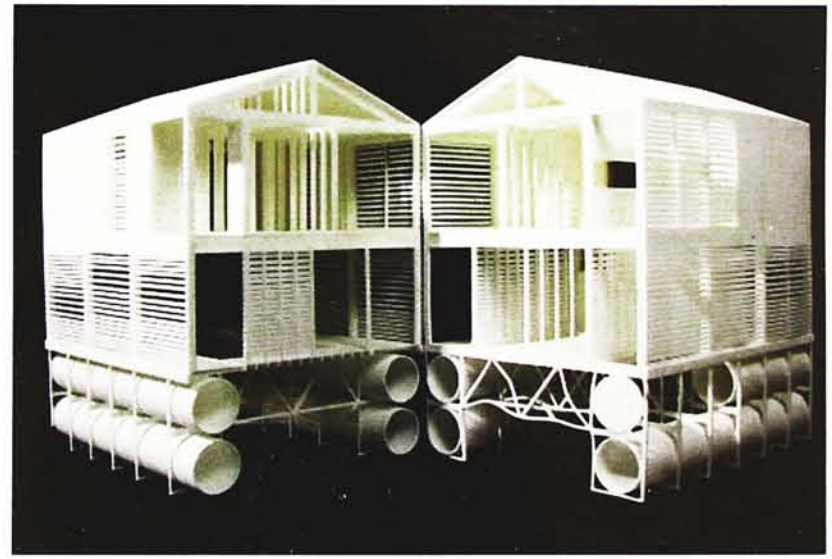
Proposed by Buckminster Fuller for multiple locations, including San Francisco and Tokyo, Tetrahedral City was to be a floating or land-based residential pyramid that could grow to accommodate one million inhabitants. The building was to have three triangular walls for a total of 300,000 living units, 200 stories tall with two-mile long walls at its base. Large openings in the structure would occur every fifty stories, allowing sunlight to enter the public garden at the bottom of the interior. Three city centers would rim the structure at different level. Each of these featured 'a community park, complete with lagoon, palms and shopping center in geodesic domes.' Fuller employed the tetrahedron shape due to its having the most surface per volume area of all polyhedra, and therefore its ability provide the most living space with full access to the outdoors.



Floating House

There are 37 houses strung along this branch of the Maas like a row of beads. At first glance, they seem quite unremarkable. Two storeys high, semicircular metal roofs and yellow, green or blue facades – hardly any clues let on that these are The Netherlands' first amphibious houses. The cellar, in this case, is not built into the earth. Instead, it is on a platform – and is much more than a mere storage room. The hollow foundation of each house works in the same way as the hull of a ship, buoying the structure up above water. To prevent the swimming houses from floating away, they slide up two broad steel posts – and as the water level sinks, so they sink back down again.

The first town based on this model, numbering 12,000 floating houses, might conceivably be built close to Amsterdam's Schiphol airport. The Netherlands are particularly low in this area. When planes come in for a landing here, one can see countless rectangular islets amid a picturesque, watery landscape. Canals weave their way like veins through the swaying reeds of green land which invariably opens out into ponds or lakes. By the year 2010, amphibious floating houses like those in Maasbommel may well form the first residential area here – or perhaps greenhouses will dominate the landscape, like the one opened earlier this month by the minister of agriculture in The Hague.

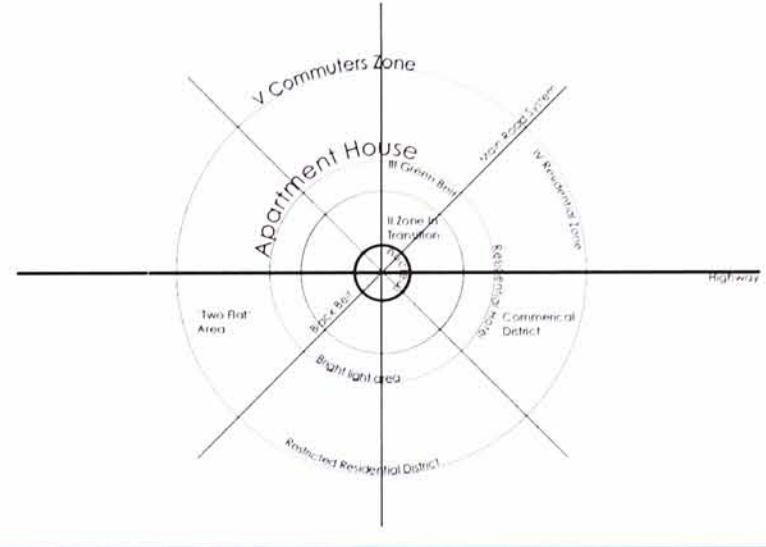


Geometry

Ideal Cities

The ideal city urban planning in the past, is formed with a nucleus/ focus point at the centre. The district and the road system follow the nucleus to expand/ develops. It formed different kind of district. The focus point is not necessary to be a fixed function. In the past, it can be a church, a government building. Nowadays, it can be a park, a commercial building, or even a sport venue.

Diagram 2-1 The Idean Urban Planning



Real Case

For the real case, Such as Paris, London, Berlin, Moscow also following such ideal city diagram to develop.

Diagram 2-2 Diagram of Paris

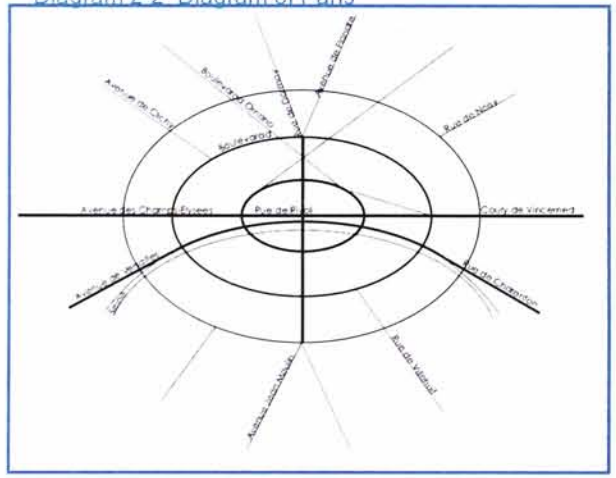


Diagram 2-3 Diagram of Moscow

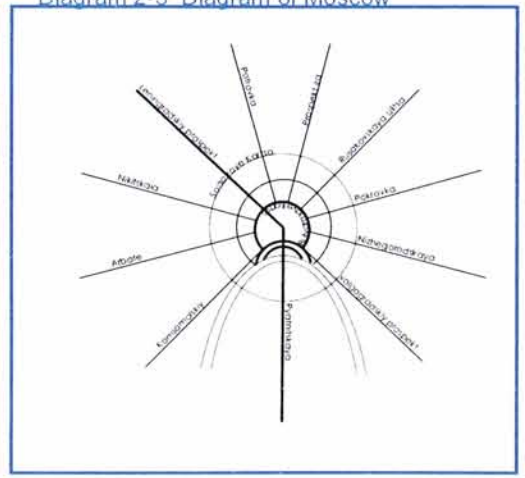


Diagram 2-4 Diagram of London

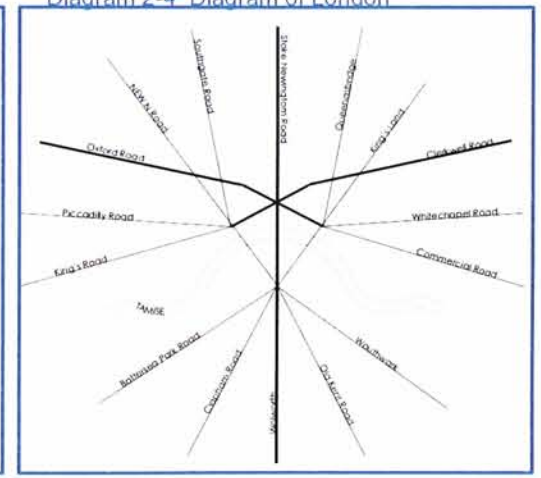
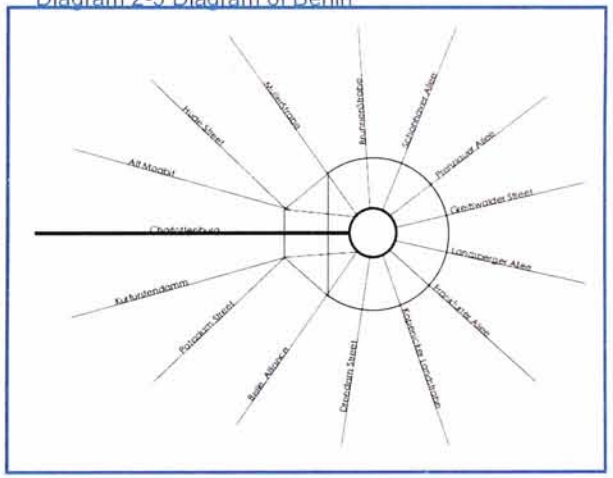


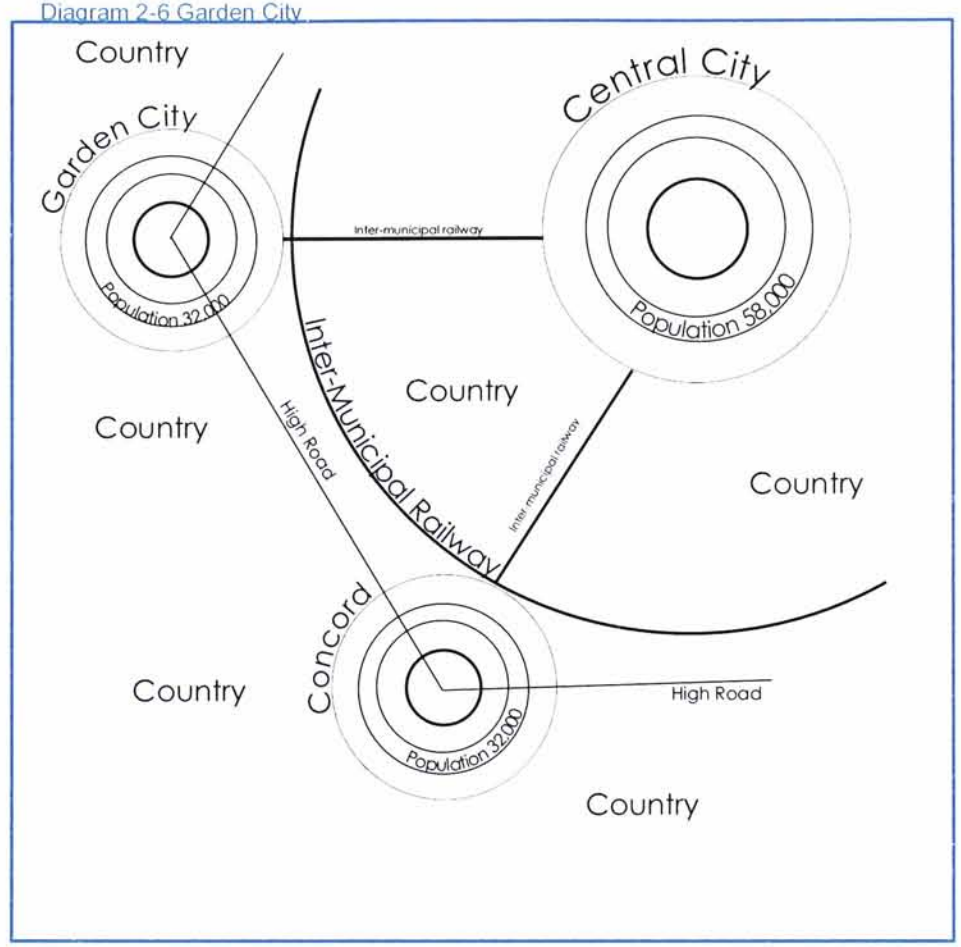
Diagram 2-5 Diagram of Berlin



Further Expansion

Population increases with time, urban cities always need expansion. So what is the ideal expansion direction of an ideal city? Forming a loop and a loop around the centre, just like Beijing? When the district was developed far away from the centre, it always separated with the existing cities by the green belt. As the result, the expansion areas provide a few or even no employment opportunities. Then garden cities and the concept of new town are introduced.

Diagram 2-6 Garden City



Coastal Cities

It is similar to the city diagram on the land, but it is not a complete circle. The development of the city was blocked by the water/ sea. Highway is used for separate the sea. The centre is located at the offshore,

Diagram 2-7 Diagram of Coastal Cities

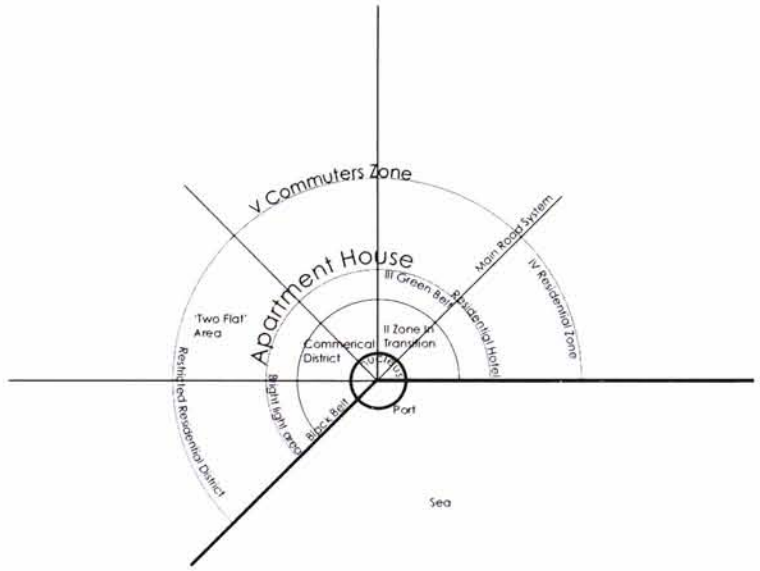


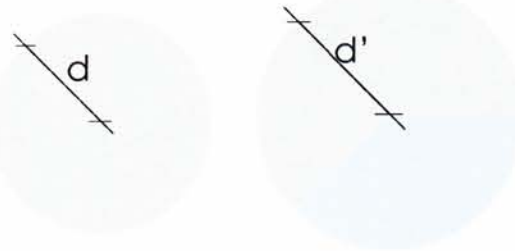
Diagram 2-8 Analaysis on the Diagram of Coastal

Inland city Coastal city Population = p
Area = A

100%

62.5%

Density of inland city p/A < Density of coastal city p/0.625A



Distance between the centre and the border d < distance between the centre and the border d'

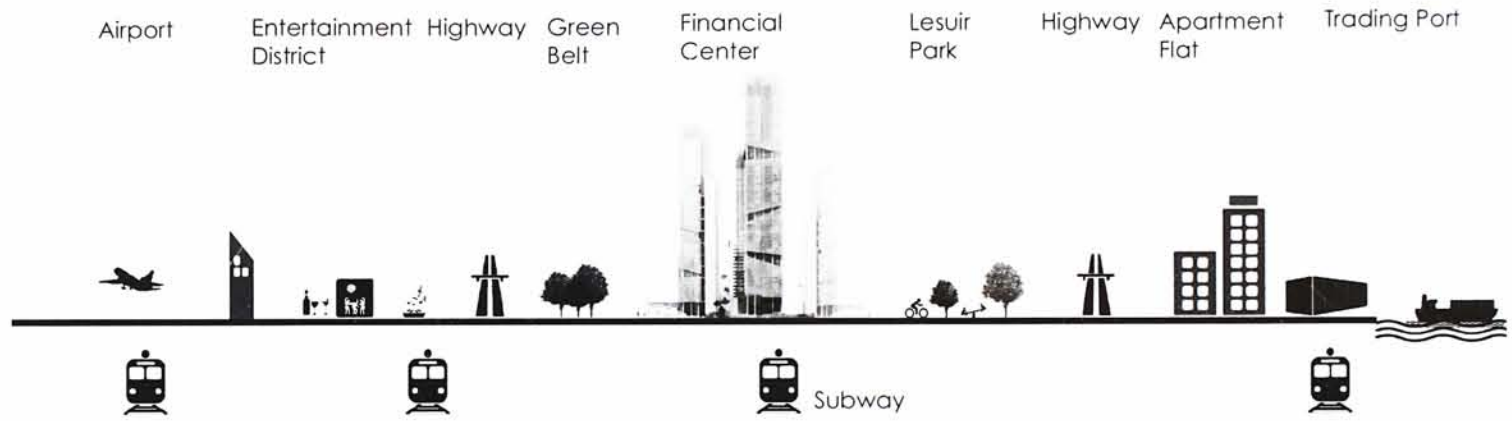
City Function

Besides geometry, there are lots of factor affecting city planning, one of them is city function

Financial City

Financial city required some factors for the city further expansion, such as the financial tower at the center; the green belt to separate the district; the entertainment district for the businessman after work; the apartment house and hotel for the businessman living; the airport, trading port, and railway system to transfer the goods.

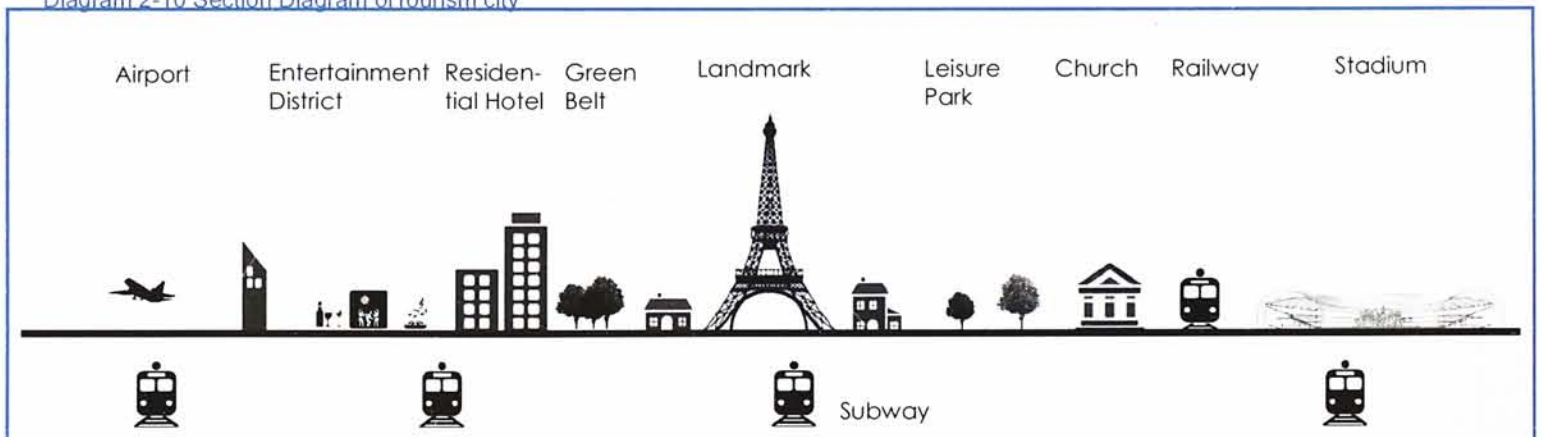
Diagram 2-9 Section Diagram of Financial city



Tourism City

Tourism city require a landmark in the city center; they also need some hotel, hostel to support the tourist; A good transportation system also needed in the city; Religious, characteristic district, stadium to attract the tourist can be also planned in the city.

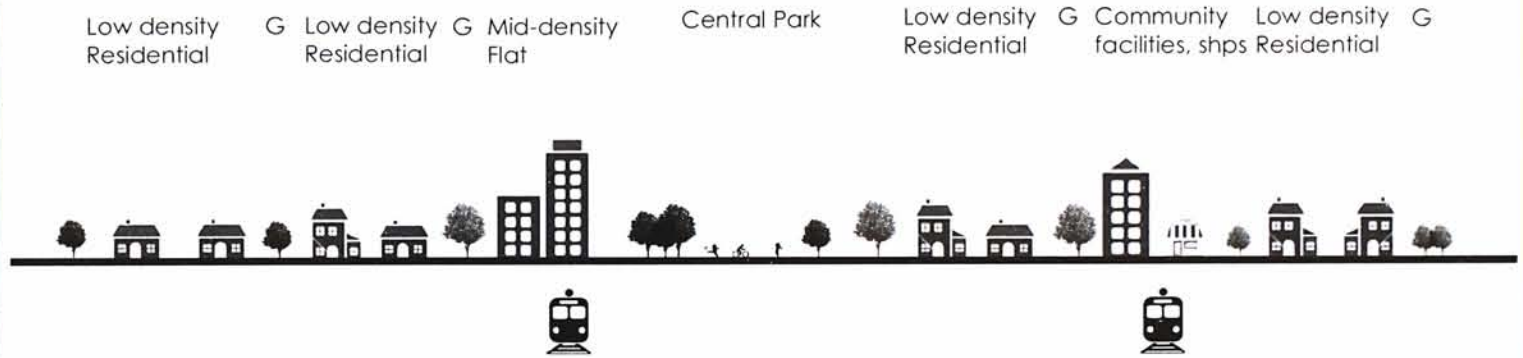
Diagram 2-10 Section Diagram ofTourism city



Low Density Residential City

A large proportion of the area should be a low density residential district. In between the districts, Park or green should be planned to enhance the living environment.

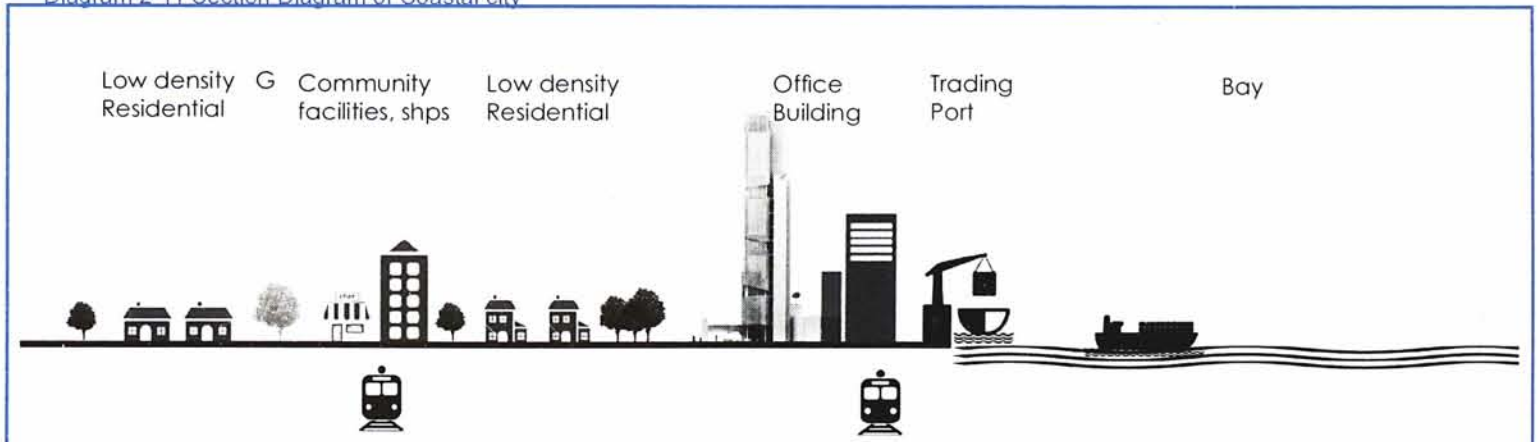
Diagram 2-11 Section Diagram of Low Density Residential city



Coastal City

A large proportion of the area will be the sea, the left area will be distributed the commercial area, the residential area, in very high density. The best location of CBD will be located near the harbor for better trades of goods.

Diagram 2-11 Section Diagram of Coastal city



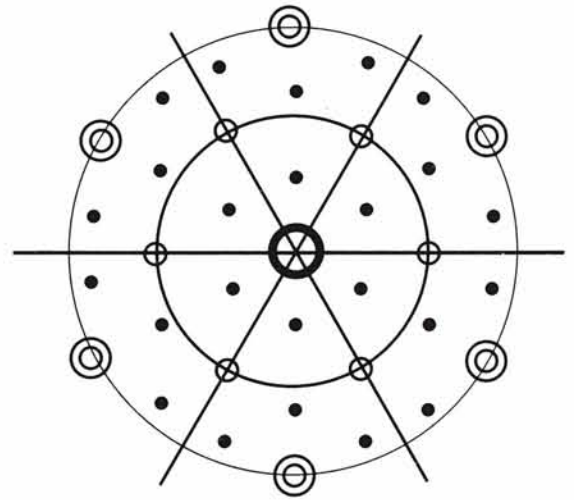
Decentralization

Density Control is a very important issue in urban planning. The density should be well controlled, in order to provide better life for human. We can't design a city with a very high density and the population in the centre or in ore point, The density should be well disturbed all around the city. Normally, we are using New town and Green Bett to this.

New Town

People developed a new town or a new sub-nucleus around the existing cities. The new town should have or can have different function building at the centre, to make sure the population will not only concentrated at the old city. Linkage system should be well planned, in order to link the far sub-urban centre with the original centre.

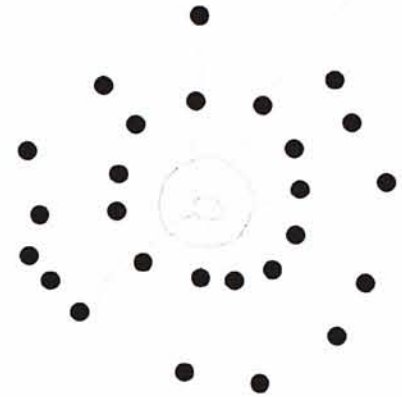
Diagram 2-12 Diagram of New Town



Green Belt

Expansion areas connected directly to the city and organized according to the principles of modern urban planning had similar characteristics. Green areas represented one of the most important structuralizing elements. A green belt usually separated the existing city from the expansion area; green wedges that cut through the developed area eventually became part of the surrounding countryside. The districts themselves were also separated by smaller green belts. Because the expansion areas themselves offered few or no employment opportunities, they were genuine residential districts, whose inhabitants relied on the big city and on nearby business or industrial sites for work. The building density varied, but a common goal was to realize as many single-family dwellings as possible.

Diagram 2-13 System of satellite cities around Moscow, 1920s



City Transformation

Reason

There are so many reason that make a city transform. The sudden rise of population, the development of different city, the environmental issue, etc.

Method

There are several traditional method to expand the city, both in form and city function. It can expand in all direction in inland cities, or expand only in selected direction in coastal cities. Or it can expand vertically like Hong Kong.

Diagram 2-14 City Transformation in Form

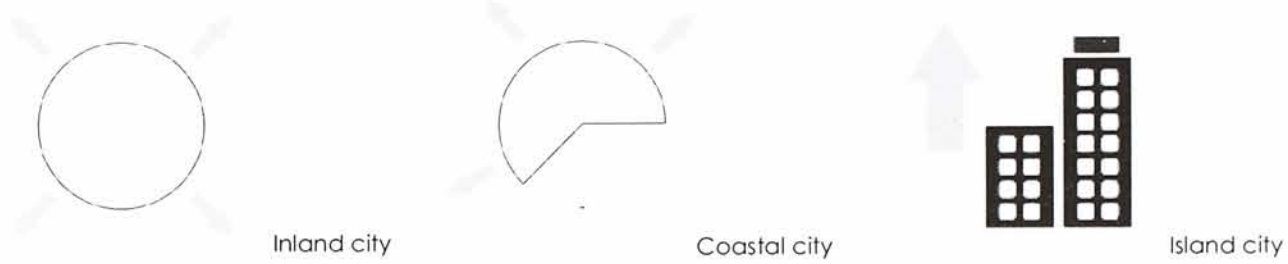


Diagram 2-15 City Transformation in Form

Potential Site – Shenzhen bay

I will choose a potential site- Shenzhen bay, to explain my proposal to expand the coastal city. The city will divide into 3 district, district zero will be the original sea; District one will be the area which will be covered by the water when the sea water level rise 1 meter; District two will be the are which will not be covered by the water when the sea water level rise by 1 meter. Floating city will be located on the District one, and will become the new CBD of Shenzhen bay, Rail system will be connected District 0 to the inland parts. District one will be under water together with the existing building. The water is allowed to run in this district by using canal. People will living in the existing building and also on the water. District three will be full of the urban farming, as the land is limited in the future, and so as a place to producing food.

Diagram 2-16 Flooding Area of Shenzhen Bay

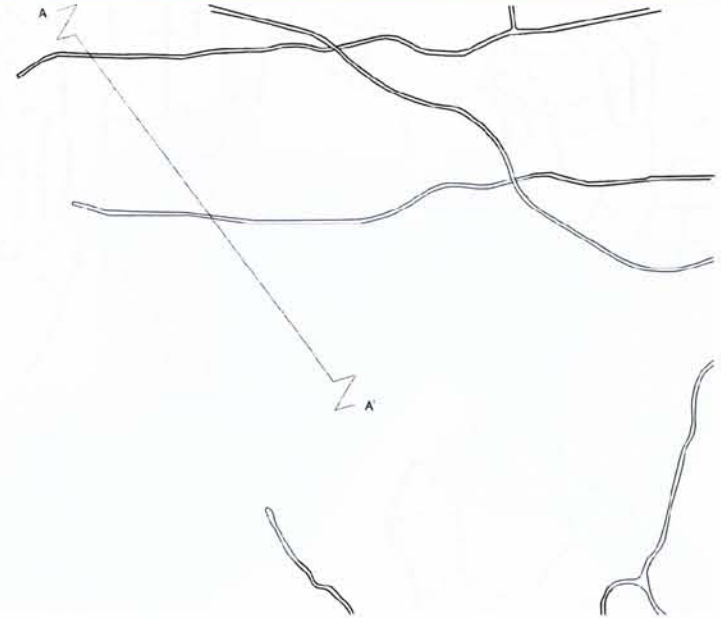
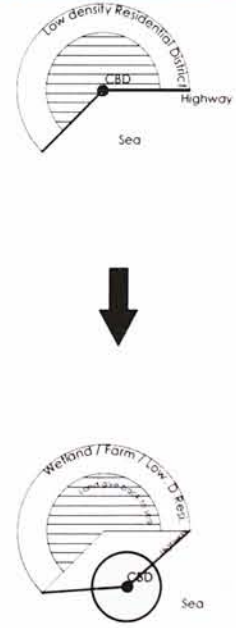


Diagram 2-17 Proposal



District 2 :
District which will not be affected when the sea level

District 1 :
District which

District 0 :
The oringinal Sea

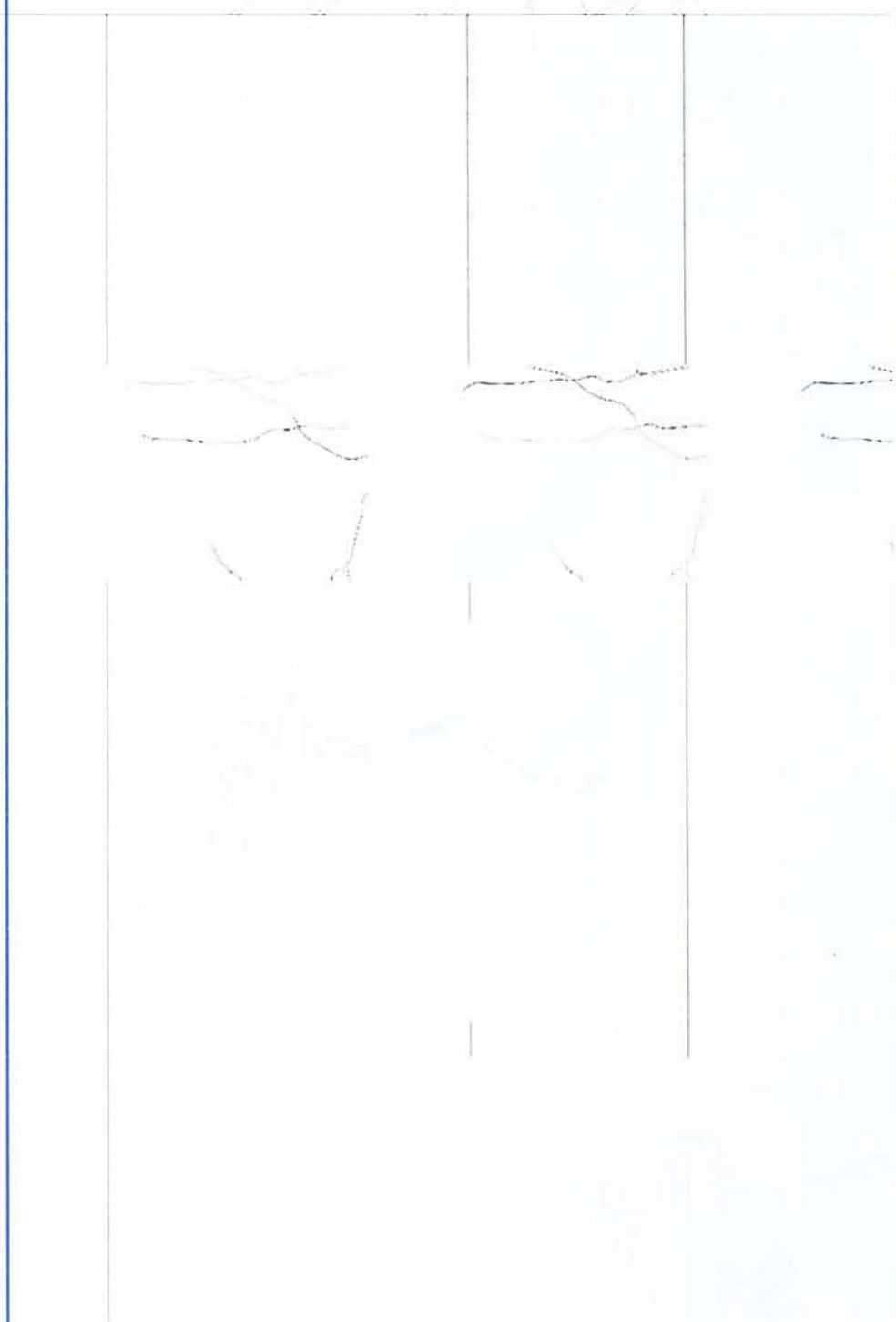


Diagram 2-18 Proposed City Transformation of ShenZhen Bay

Comparing Cases

By studying other cases, I can have a sense of scale, how big is the floating city, in terms of the population, in terms of the density. What is the living style on the water I would like to design in the floating cities. As a result, I selected five different groups with different population, density and living style to compare.

Groups

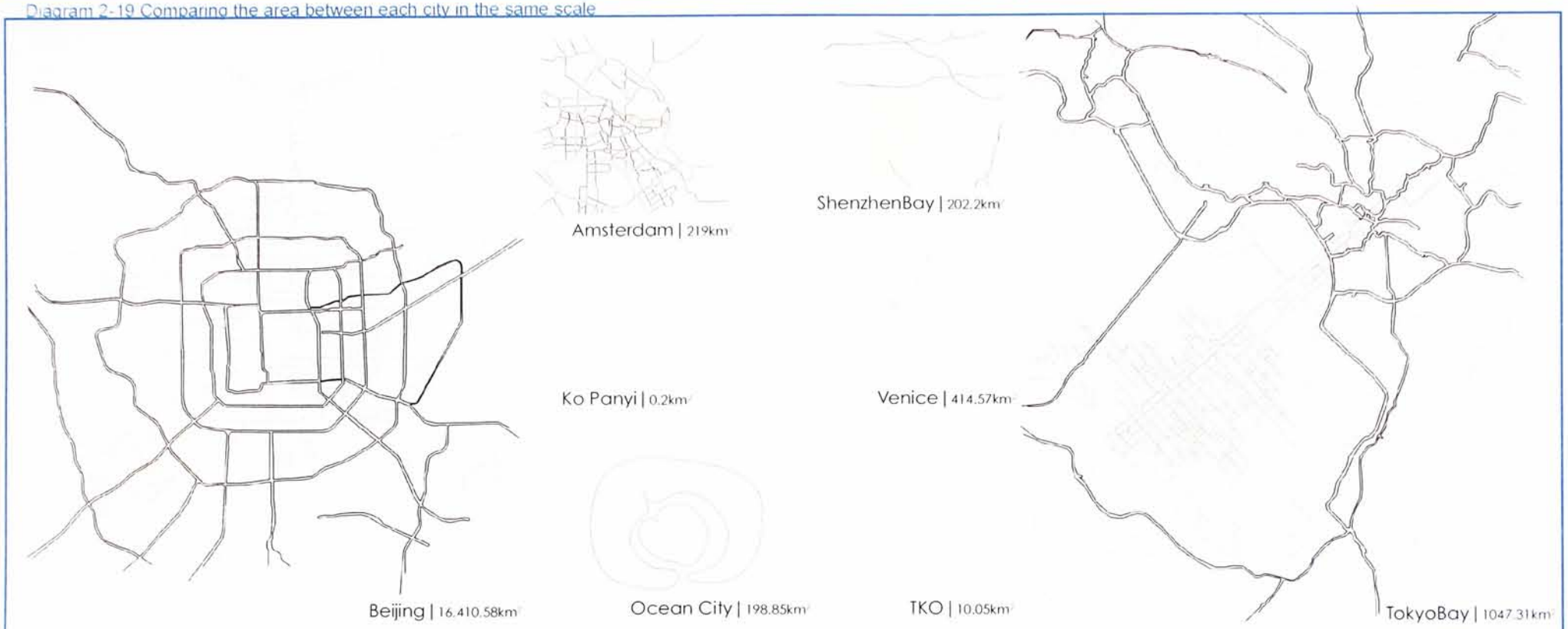
A. Water village – Lo Panyi
B. Water city – Venice Amsterdam
C. Metabolism city – Tokyo bay, Ocean City
D. Potential Site – Shenzhen Bay
E Hong Kong Ref.Town 0 Tseung Kwan O

Background Information

Area

By comparing the area, I would like to design the master layout plan with 200 km2, similar with Venice. And design the floating city with 10km2, similar with TKO in Hong Kong.

Diagram 2-19 Comparing the area between each city in the same scale

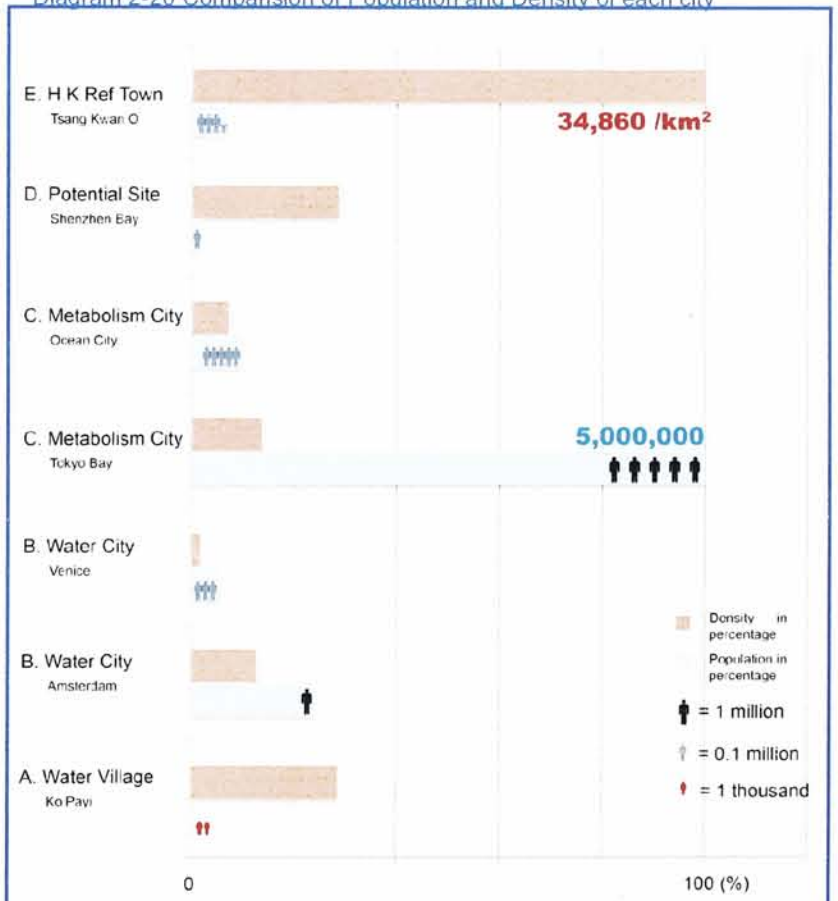


Population and Density

By comparing the population and density, It show that the metabolism city have the most population with 5 million; and TKO have the most density with 34,860 people per km2. I am not aiming as a rescue project like metabolism cities, so I aim the range of population is around 0.1 – 0.5 million with a low density with 500-2500 people per km2.

Diagram 2-21 Diagram of Density of each cities

Diagram 2-20 Comparision of Population and Density of each city



Land Use

Different city have their different function, Tourism and financial city in Amsterdam; Tourism and fishing village in Ko-Panyi; Multi-function and Rescue Project in Ocean city; So what is the function of the water city? I would to design a CBD, a financial center to replace the original CBD with certain amount of residential district to support the CBD.

Diagram 2-22 Different Type of Water Cities

Diagram 2-22 Different Type of Water Cities

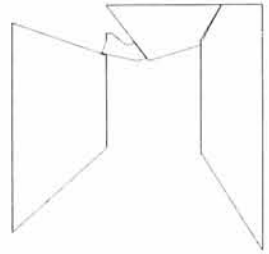
A. Water Village	Ko Panyi	Scale : Smale Program : Tourism village Fishing village
B. Water City	Amsterdam | Venice	Scale : Large Program : Tourism city Financial centre
C. Metabolism City M	Ocean city | Tokyo City	Scale : Medium Program : Multi-function Surving Project
D. Potential Site ?	Shenzhen Bay	Scale : Smale Program : Financial city Developing city
E. Hong Kong Reference Town	Tseung Kwan O	Scale : Smale Program : Residential New Town

Living Style

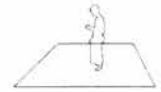
As a Leisure Land

By comparing the water village and water city, there are so many differentiations in the water living style, in the field of living space, the passage, the working space. By analysis in those field, I would conclude that water village have a strong feeling that they are living with the water, in the opposite, water city is trying to block the water entering the life. It can be because of their forms (regular and organic), the canal (straight and curve)

Diagram 2-23 Analysis on the living style of water village and water city

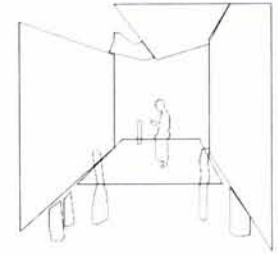


Living Space are in the two sides of the sea water

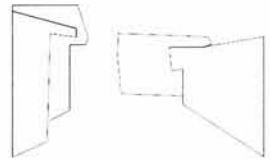


Working Space are in the outdor between the living space

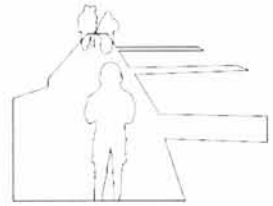
Structure support the houses 'floating' on the water



The wooden piles allow the water pass though the houses, but not controling them

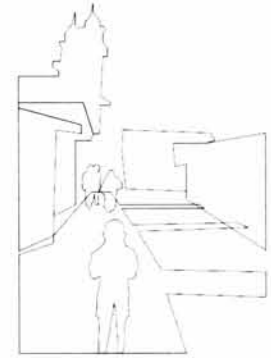


Living Space are in the two sides of the sea water

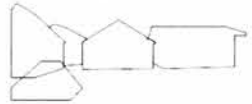


The passage are on the side of the canal.

The Religous building are on the side of the canal.



The passage connecting the living space and human. The water block people to enter the privae space phythough scially , but allow them visionally.



Living Space are forming a court-yard or pond in the middle.

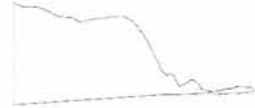
The passage are surrounding the pond

Structure support the houses 'floating' on the water

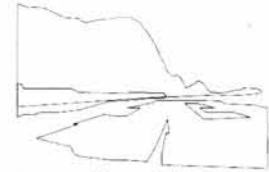
If houses formed the city on the water, varies width of canal can be formed

Living Space are alined the coastal line

The fish tank are seperated from the living space.



Do not have any building on the landscape .

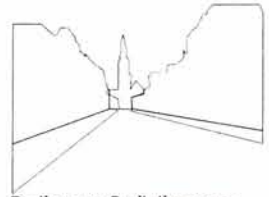


As a self-sustain water city, fishing is a very inportant job nature.

Living Space are alined the coastal line

Passage are very straight, as it is formed by the canal

Religous Building are located at the center , and the canal are radiated from the cente



Religous Building are located at the center , and the canal are radiated from the cente

As a Transportation System

By comparing the city plan of Amsterdam, we can observe that the canal can be a very good transportation network, it's even as good as the road system. The Dutch used the water as a transportation tools, and relied on it. By separated the canal system and the road system into two layers, we can observe them individually, the two system work in two different purpose. The canal system works as a slow traffic and separating different local district; the road system as a fast traffic, and linking the long distance region. On the other hand, the villagers in the Ko[panyi do not see water as a transportation tools. They do not form any canal, they just allow the water to flow freely.

Diagram 2-24 Water System of KoPanyi

Diagram 2-25 Water/Canal System of Amsterdam

Diagram 2-26 Road System of Amsterdam

Diagram 2-27 Mind Map

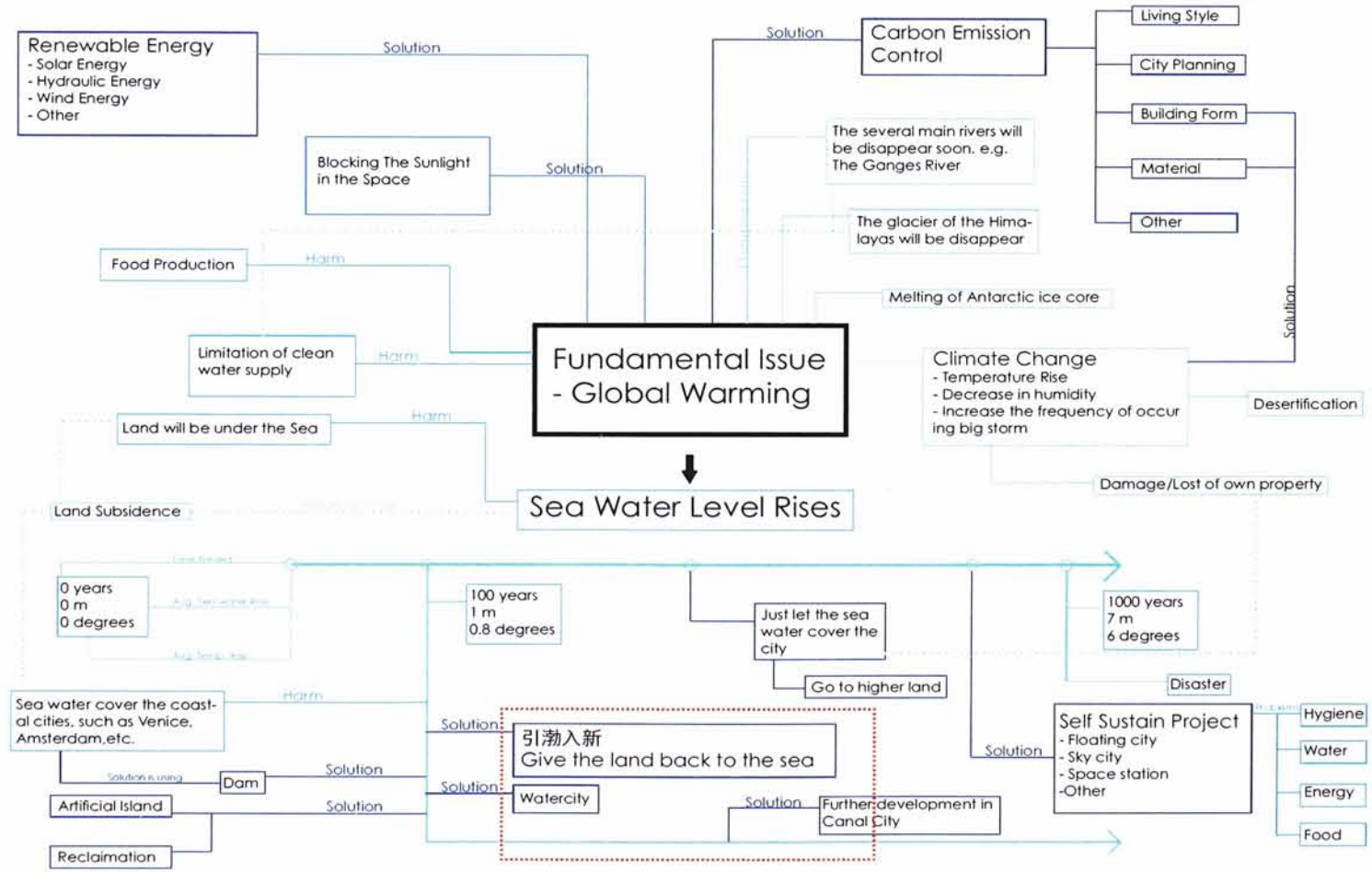


Diagram 2-28 Mind Map

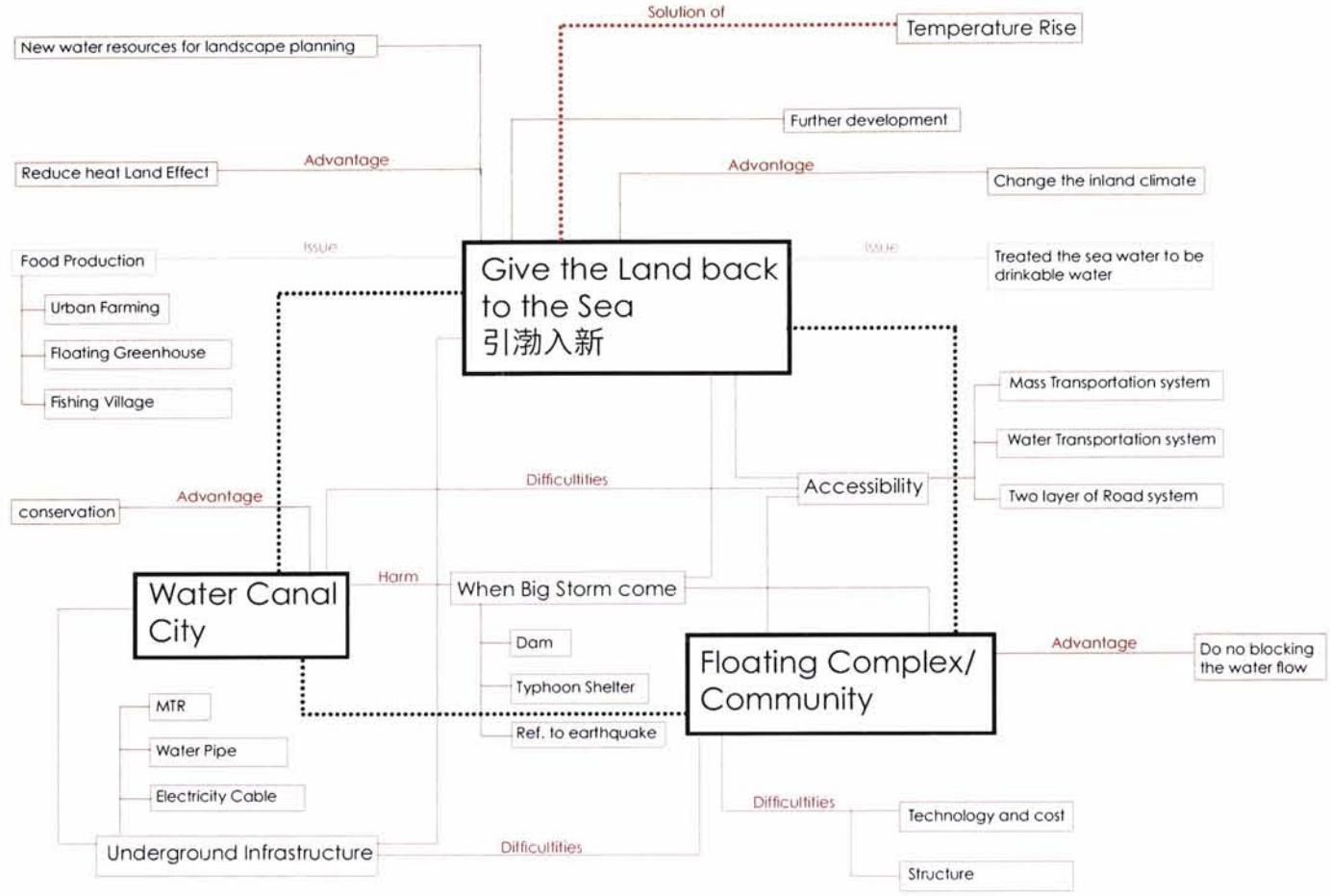


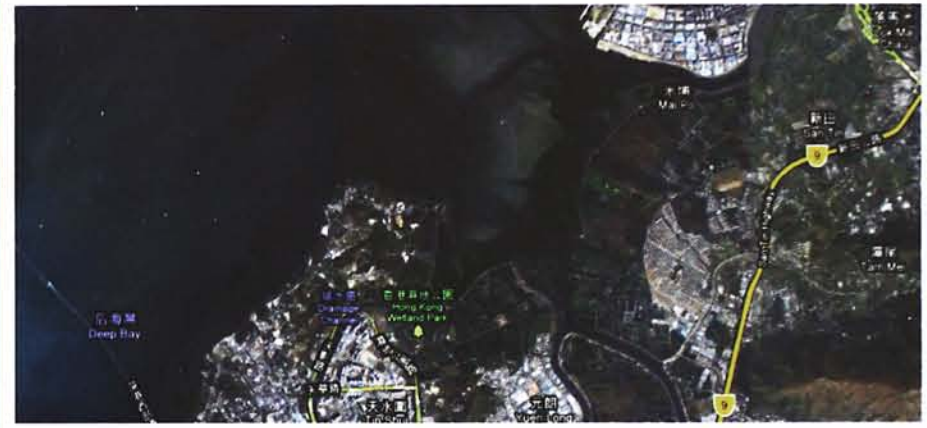
Diagram 2-29 Mind Map

Condition

Condition

The Land level is relatively very low and flat, so certain amount of the area is covered by the sea water in the next 100 years. The CBD is located near the coastal line (the site) The city should be expanding, because of the population rise or other reason.

Diagram 3-1 Site Map of ShenZhen Bay

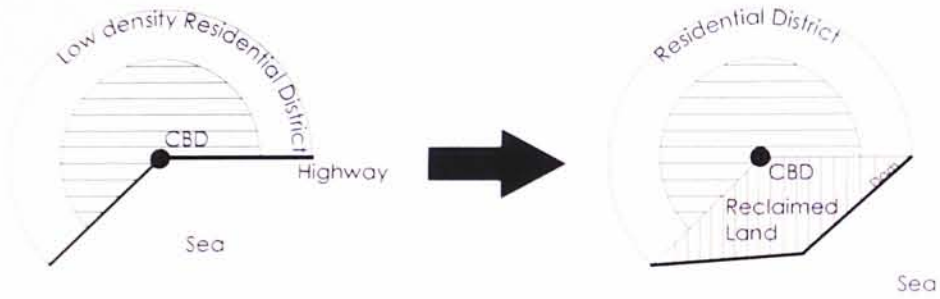


I have chosen Shenzhen Bay become my experimental site a water city and its floating cor plex. Not only because of She zhen Bay is fulfilling the abo conditions, but also because Shenzhen Bay have very goc potential for floating city.
The shape of the bay formed very good typhoon shelter to pr tect the floating city from the b storm. Furthermore, the city is e panding, and they required mo land to develop. In the past years, the reclamation in Sher hen Bay damaged the eco-sy tem in the site deeply. Using oth method to gain the land instec of reclamation should be obtai we should give the land back the sea.

Diagram 3-2 Original Land Use Plan of ShekHu District

Other Approach

Diagram 3-3 Diagram of Reclamation + Dam



Reclamation + Dam

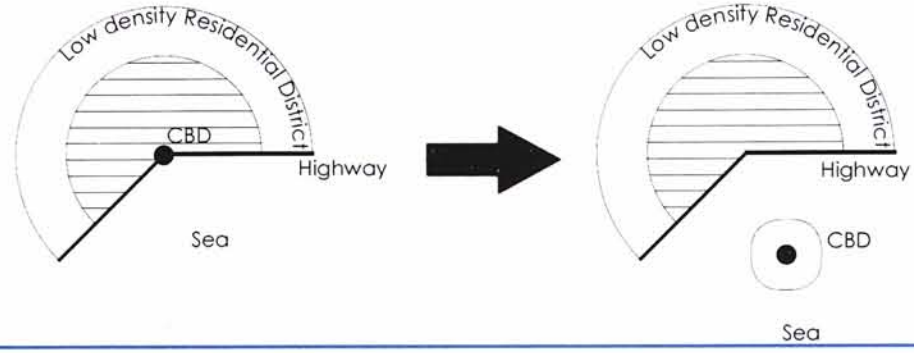
Pros: The most easy way to construct, to get the land fro the sea
Cons: Not a long term solution, as the sea level will rise again.
Damage the environment and eco system under the sea.
Many unpredicted phenomenon occur, Seabed sunk, Dam was damage

Diagram 3-4 Diagram of Moving to higher land/inner land

Moving to higher land/inner land

Pros: Will not cause big damage to the environment.
Cons: Not a long term solution, as the sea level will rise continuously
Lost all the building in the original CBD site.
Fewer and Fewer land can be use in the future.
Port is an important factor enhance the power of CBD.

Diagram 3-5 Diagram of Artificial Island



Artificial island

Pros: Extra land for development use
Cons: Not a long term solution, as the sea level will rise continuously
Lost all the building in the original CBD site.
Many unpredicted phenomenon occur,
Seabed sunk, Dam was damage
Damage the environment just like the reclaimed land.

Program

Program

Based On the Shenzhen city planning, Nanhai district near Shenzhen Bay is one of the city centre other than Fu-Tian, Luwo, etc. Besides being a city centre, Nanhai is also a new CBD in the next 50 years. It will replace the old CBD FuTian, Luwo, become a new important financial city center in Shenzhen. It also plays a very important role in linking Hong Kong and China in the future.

Diagram 3-6 Shenzhen District Planning

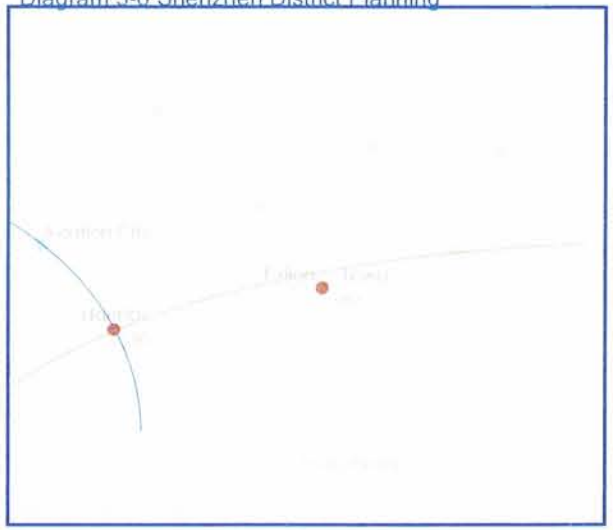


Diagram 3-6 Program Analysis of Financial City

Financial City (CBD)	Built Area	Residential	High density Residential Low density Residential
		Commercial	Financial Tower Shopping Mall
		Industrial	Heavy Industry High Technology
		Public	Educational Government
	Water	Canal	Wide Canal (For ship) Narrow Canal (For boat)
		Wetland	
		Lake	Reservoir Desalination Plant
		Bay	
	Green Space	Agriculture	Urban Farming Green House
		Lawn	Sport Green Buffer
		Park	
		Wilderness	
	Infrastructure	Roadsystem	Highway Street
		Pedestrian	Bridge Footpath
		Mass Transportation System	
		Others	Harbour Others

Master Layout Plan

Master Layout Plan

With the area 100 km2, and with the population with 0.5 million, I have divided the district into 3 parts evenly, they are the built area (33%, 33 km2), Green area (33%, 33 km2) and the infrastructure and water area(33%, 33 km2). And divided the Built area into another 4 parts, Housing district (60.6%,20 km2) , Industrial district (6.06%, 2 km2), Commercial district (30.3%, 10 km2), Public district (3.03%, 1 km2). The commercial district will be located on the floating city, together with some apartment house and the harbour. Along the old coastal line, residential district will be located and mixed with the commercial district, to form a canal city. A wide long canal will be divided the area which will cover by the water and those area which will not. A large proportion of the green area will be planned behind the new coastal line (the wide canal).

Figures of the Master Layout Plan

Total Site Area(2-D; in m^2.)	101,100,000
Floating City Area	10,000,000
Total Greenspace (m^2 .)	33,000,000
Area: Greenspace: argriculture	30,000,000
Area: Greenspace: lawn	1,000,000
Area: Greenspace: park	1,000,000
Area: Greenspace: wilderness	0
Area of Water (m^2)	33,000,000
Area of Infrastructure	10,000,000
Total Built Area [footprint; m^2]	33,000,000
Area: Housing (footprint)	20,000,000
Area: Industrial (foortpint)	2,000,000
Area: Commercial(footprint)	10,000,000
Area: Pubic (footprint)	2,000,000
Total Population	500,000
Total number housing unit	250,000
Number of people per housing unit	2-3

Total Area (3-D; in m^2)	?
Number of Floors: Housing	10
Number of Floors: Industrial	10
Number of Floors: Commercial	100
Number of Floors: Public	5
Density : total population / site area (2-D) (people per km^2)	4950
2-D Percentages	
Greenspace	33
Agriculture	30
Lawn	1
Park	1
Wilderness	1
Water	33
Infrastucture	10
Built Area	33
Housing	20
Industrial	2
Commercial	10
Public	2
Total Land Use	100

Diagram 3-7 Land use Chart of the MLP

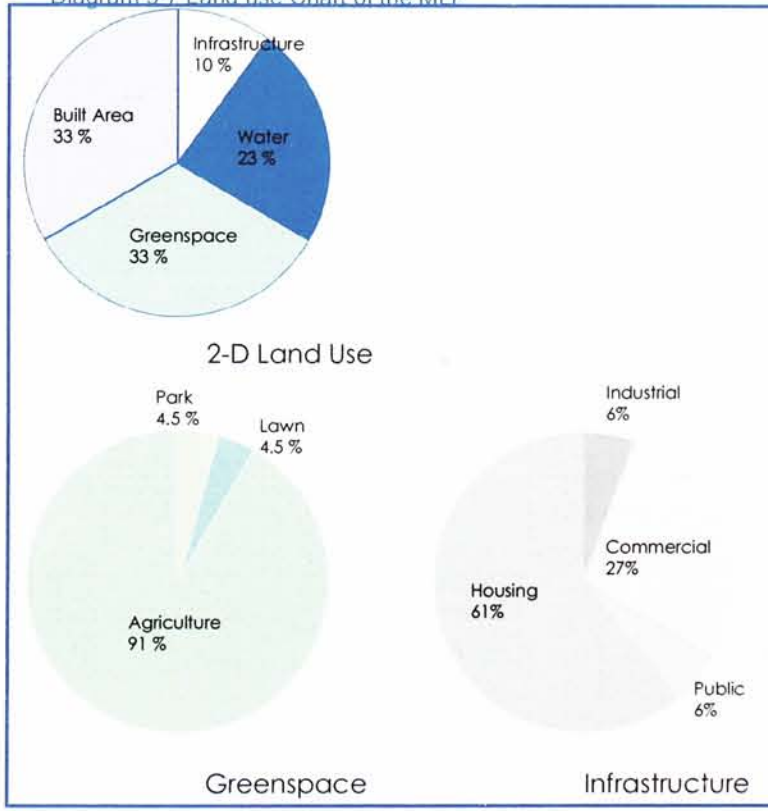
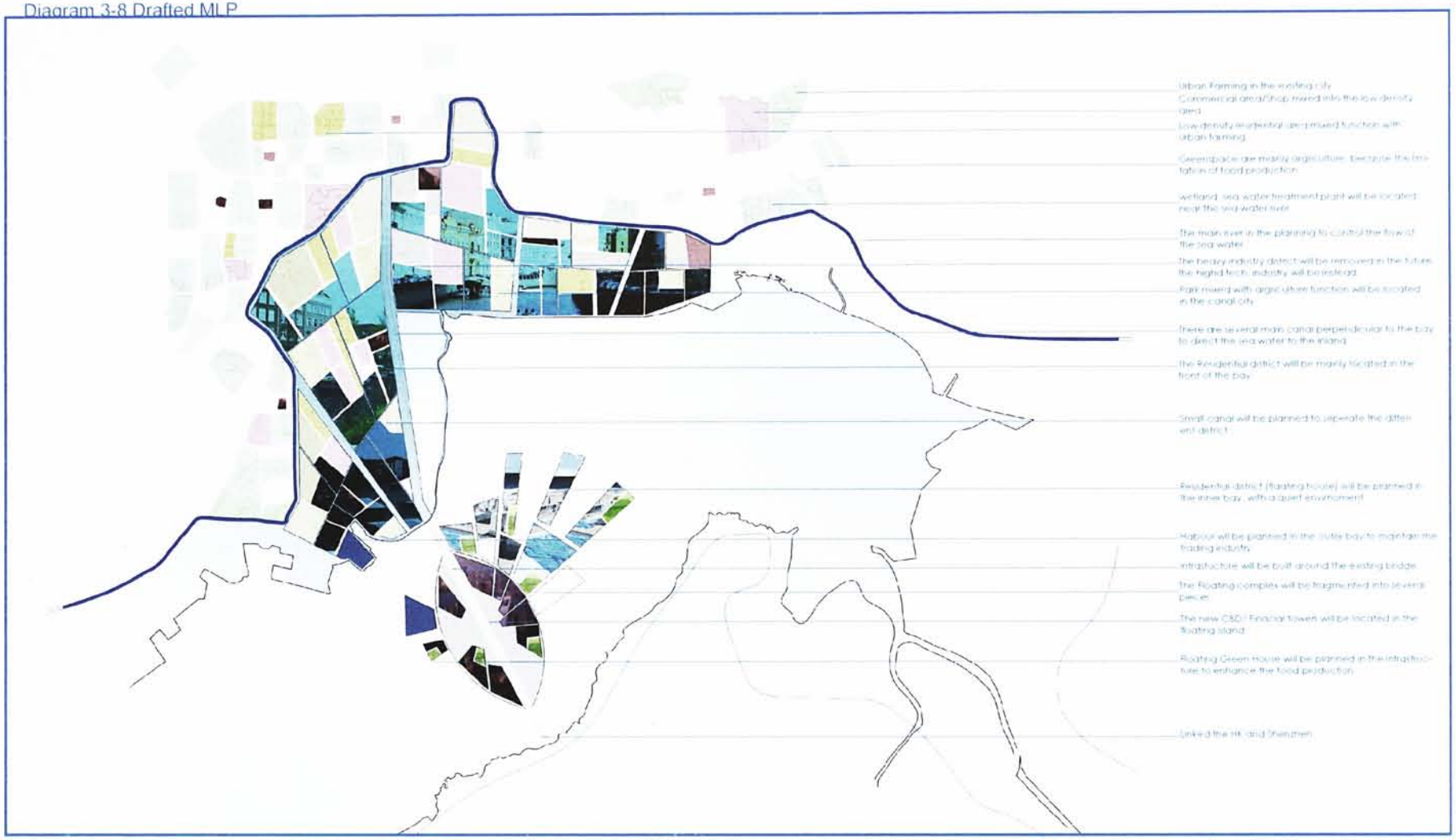


Diagram 3-8 Drafted MLP

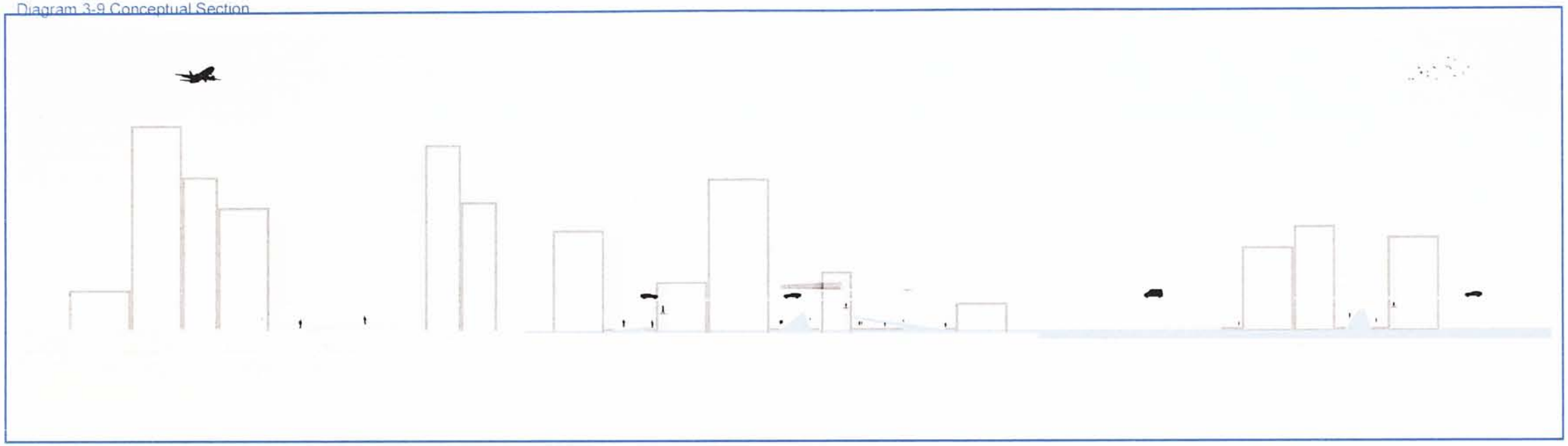


Sectional Design

Sectional Design

I believed that the circulation in the future city should be divided into several layers, minimum two. The circulation on the ground will be mainly for the slow traffic or for human activities, the canal improve the environment for the human, and there will not have any pollution caused by the private cars; the car and the railway system will be elevated, to separate it from the slow traffic, and used to connect the long –distance region.

Diagram 3-9 Conceptual Section



Index

Conclusion and Expectation

After the research study, I am struggling with choosing either design a floating city or a water city. For the former, it is very difficult to say is it suitable for my thesis statement, and is it really can benefit to the environment. To conclude in this stage, I would try to narrow my design. I would give up the floating city, and based on the sea water level situation to have a re-urban planning of Shekou district which is the offshore area of Shenzhen bay, after the sea water level rised 1 meters and covered the Shekou district. A new living style, building method, transportation system with water, etc is introduced in this new district.

Website

http://en.wikipedia.org/wiki/Kansai_International_Airport
http://www.kiac.co.jp/en/tech/sink/sink1/index.html
http://flood.firetree.net/?ll=33.8339,129.7265&z=12&m=7
http://en.wikipedia.org/wiki/Current_sea_level_rise
http://hk.myblog.yahoo.com/jw!cDdf7uqTCRhPXmiXVeKZP.Yy/article?mid=696
http://travel.sina.com.hk/cgi-bin/nw/show.cgi/386/3/2/88664/1.html
http://c.chinavisual.com/2009/12/18/c63687/p7.shtml
http://blog.yam.com/kueihsienl/article/6966497
http://www.citg.tudelft.nl/live/pagina.jsp?id=57b558be-76bb-4478-ae5f-265d6ec6aa07&lang=en
http://en.wikipedia.org/wiki/Venice
http://en.wikipedia.org/wiki/Amsterdam
http://www.climatechangebusinessforum.com/zh-cht/page/show/hong_kong_context_affected

Book

Kenzo Tange : 40 ans d'urbanisme et d'architecture.
丹下健三 / 馬國馨.
圖解都市計畫 : 圖解化及記號化之都市計劃學及都市設計方法 / Dieter Prinz 著 ; 崔征國譯.
Mastering the city : North-European city planning, 1900-2000 / Koos Bosma and Helma Hellinga, (editors).
Mastering the city : North-European city planning, 1900-2000 / Koos Bosma and Helma Hellinga, (editors).
Water house / edited by Felix Flesche ; texts by Christian Burchard and Felix Flesche ; [translated from the German by Ishbel Flett, Fiona Elliott].
Building on the sea : form and meaning in modern ship architecture / Peter Quartermaine.
Floating cities : Venice, Amsterdam, Leningrad-and Moscow / Stephen Wiltshire ; with a foreword by Oliver Sacks.
Kenz Tange : 40 ans d'urbanisme et d'architecture.

Video

Six degrees
大愛新聞_漂浮的未來_世界第八大奇觀 三角洲工程
大愛新聞_漂浮的未來_荷蘭與海爭地 面臨海水上升危機
荷蘭人將土地還給大海的治水策略
大愛新聞_漂浮的未來_因應海平面上升 打造未來漂浮屋

Software

Flood map simulation

Design

05 Design Intro.

06 Design Concept

07 Desigb Diagran

08 Plan & Section

09 Perspective

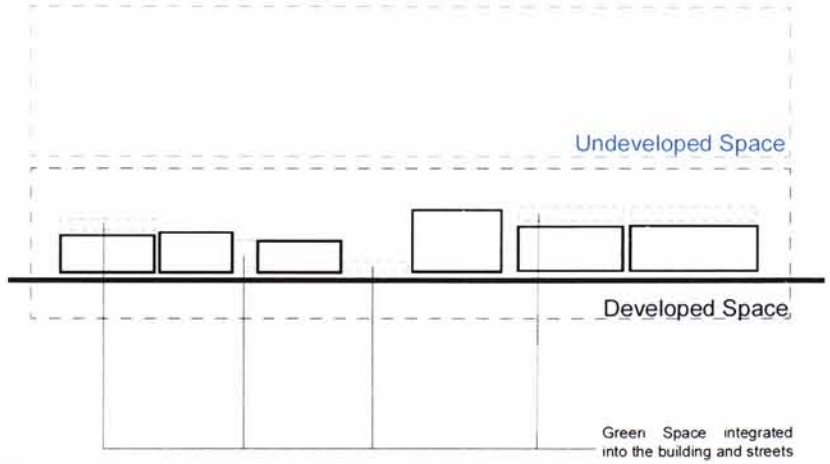
Thesis Statement

After the research and before starting the design, I would like to amend some view of my thesis statement. As I said in the last statement, the most important is the attitude towards the environment issues, but not the technical problems. The most influence places would be the coastal city, not the sea, not the inland city. So that this project should be a city re-planning about the coastal city, instead of building a floating city on the sea or re-planning the inland city.

Density Distribution

In the traditional urban planning, the density will be distributed in horizontally, especially in the city of China which have lots of flat rural lands. The concept will be totlally difference when developping on the water. The city will be grow vertically , let the water pass though the city. In order to remain the accessibility as on the land.

Diagram 6-1 Traditional City planning with undeveloped space



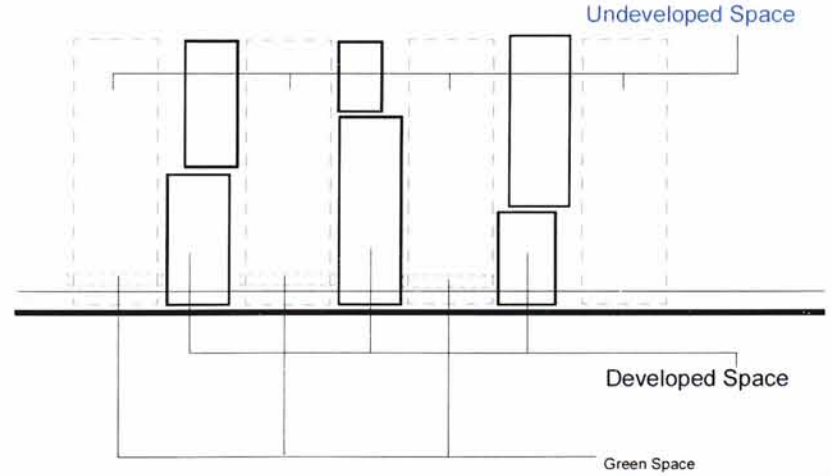
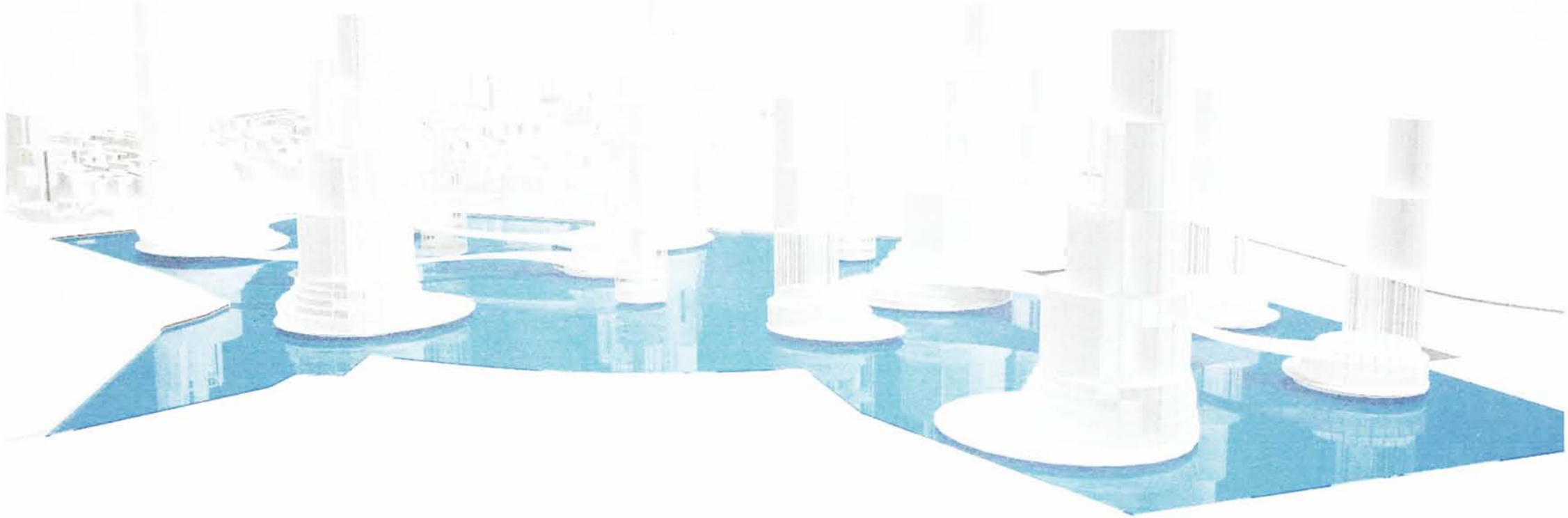


Diagram 6-2 Preliminary Design Concept



Complex City x Floating Landscape

The city will be mixed programs and formed by several verical district in a 400 diameter cluster, which is a walkable distance. Between difference cluster, underground railway system will connected them together, to form a U-life. As the sea will cause disorder to the lower part of the city, the city will be elevated and the floating landscaoe will be on the water instead. The floating landscape is not only give the green area to the city, it also allow the landscape to rises together with the sea or even the big eave covering the landscape with very little property lost, which is difference when residential and commercial are floating.

Diagram 6-3 Complex city, verticle city diagram

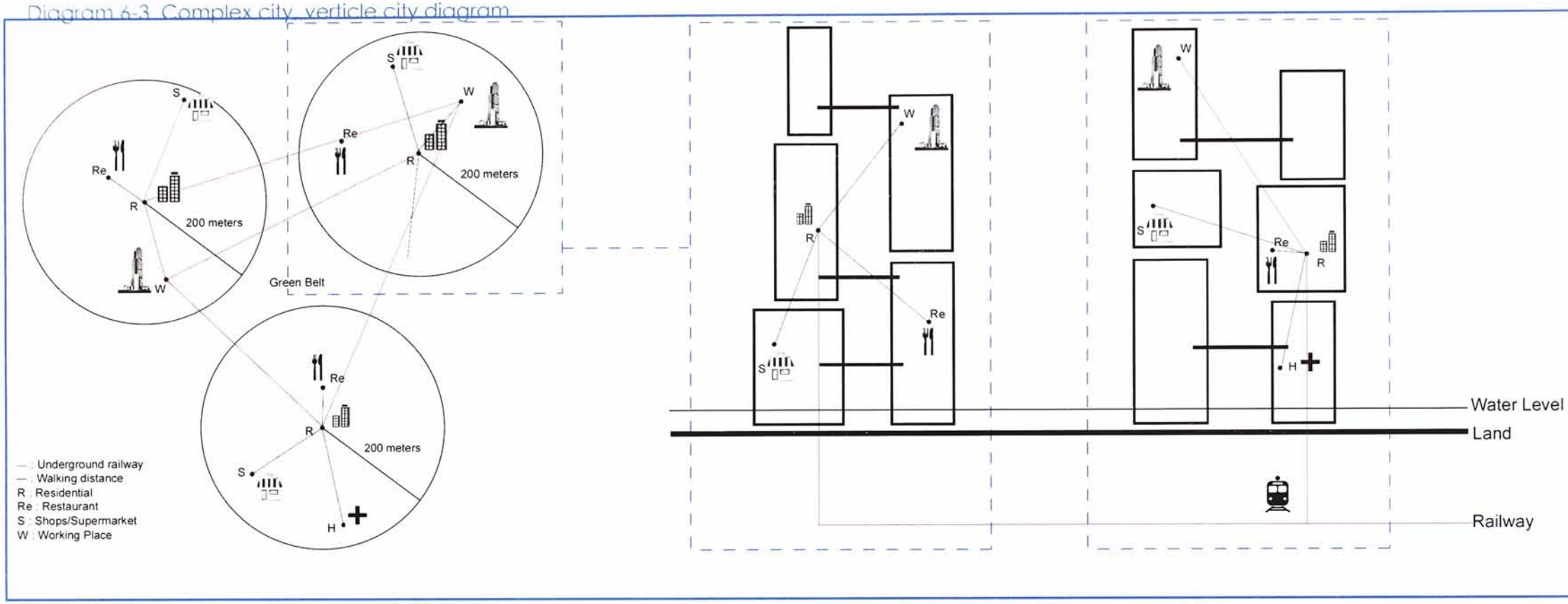
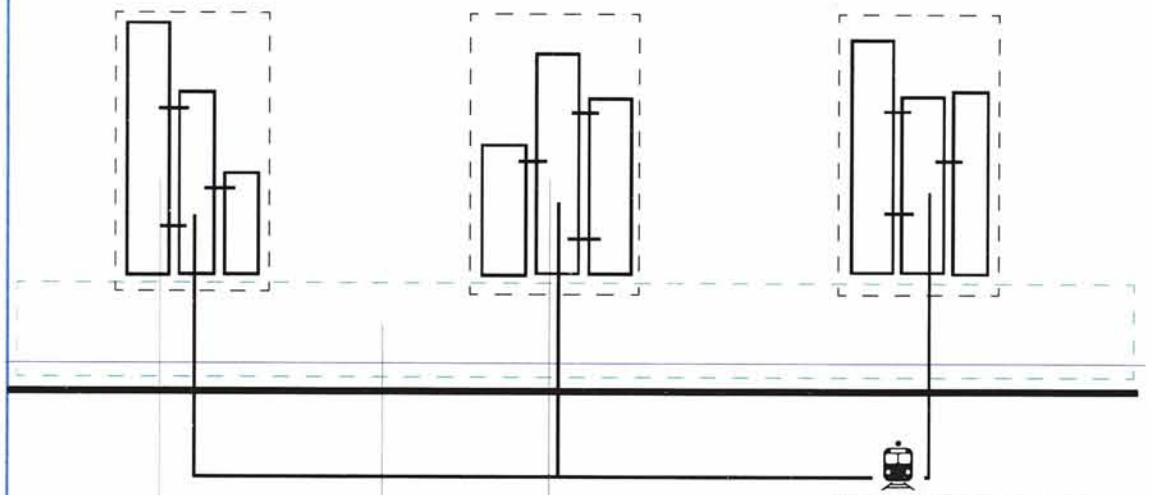


Diagram 6-4. Elevated City



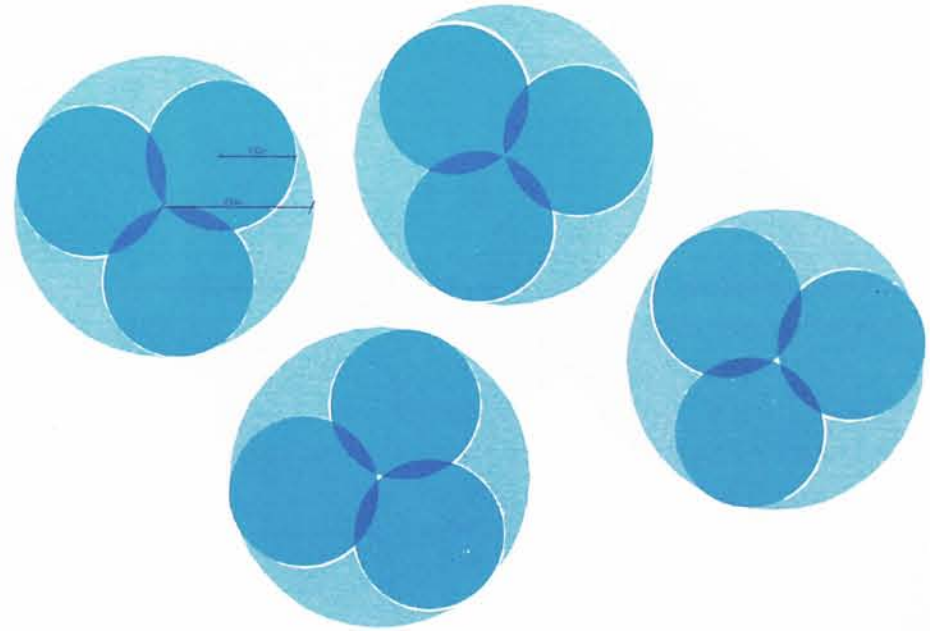
Underground Railway to connect each cities.

Developed Space

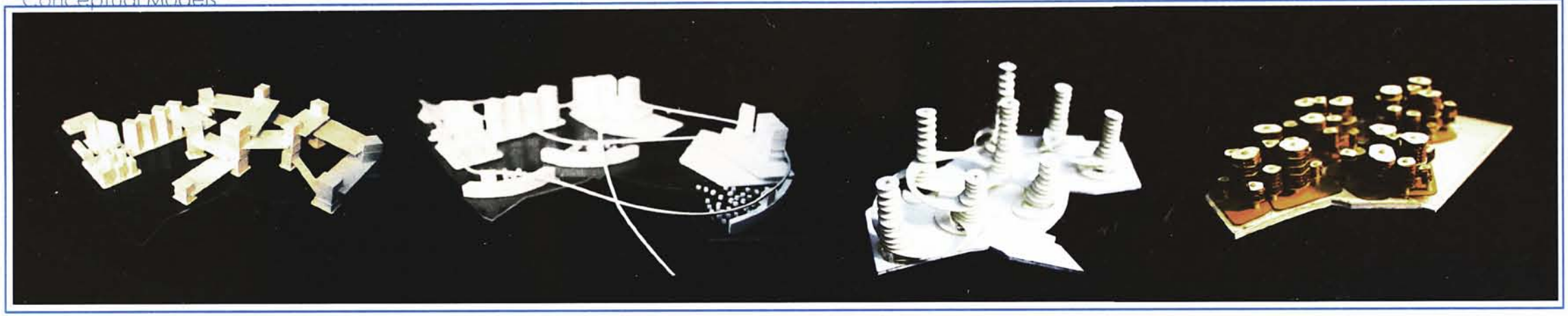
As a compact city, Building with Mixed function are elevated in a high density layour.

Green Space

With the help of the water, continous green space under the compact city.



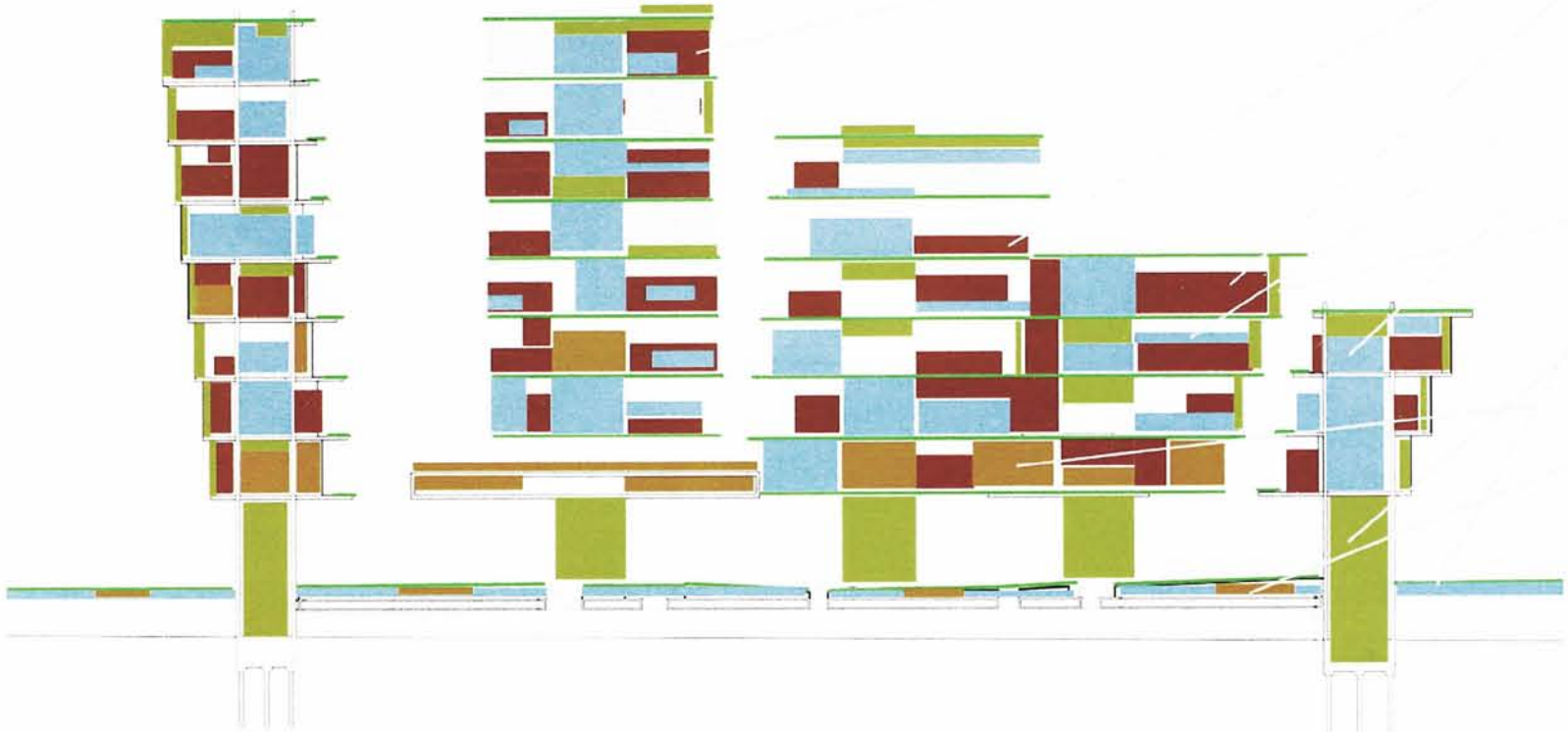
Conceptual Models



Master Layout Section

As the vertical city design, the master layout is shown as section.The programes are mixed in the tower, residential , commercial ,Public space ,etc. People can access to their work places, their home or restaurant easily. Residential district are mainly locatedin the outside of the tower, together with some shops. Commercial district are located in the center of the core, for quicker transportation for trading. The Public Space and facilities are locating at the lower part of the city , so that it can much quicker and easier to reach every part of thedistrict. Water market and greenery are planed on the continue floating , which the citizens can enjoy ouside in the good weather.

Diagram 6-5 Elevated City



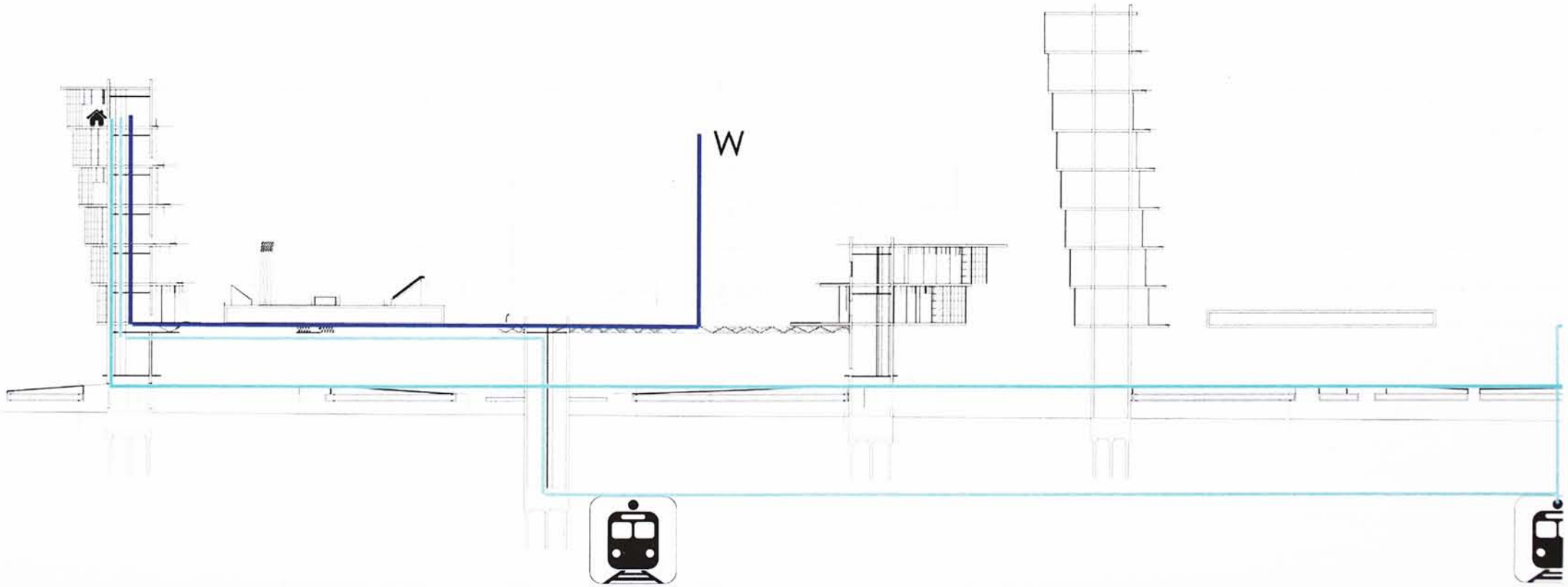
Residential

Commercial
Shop
Water Market

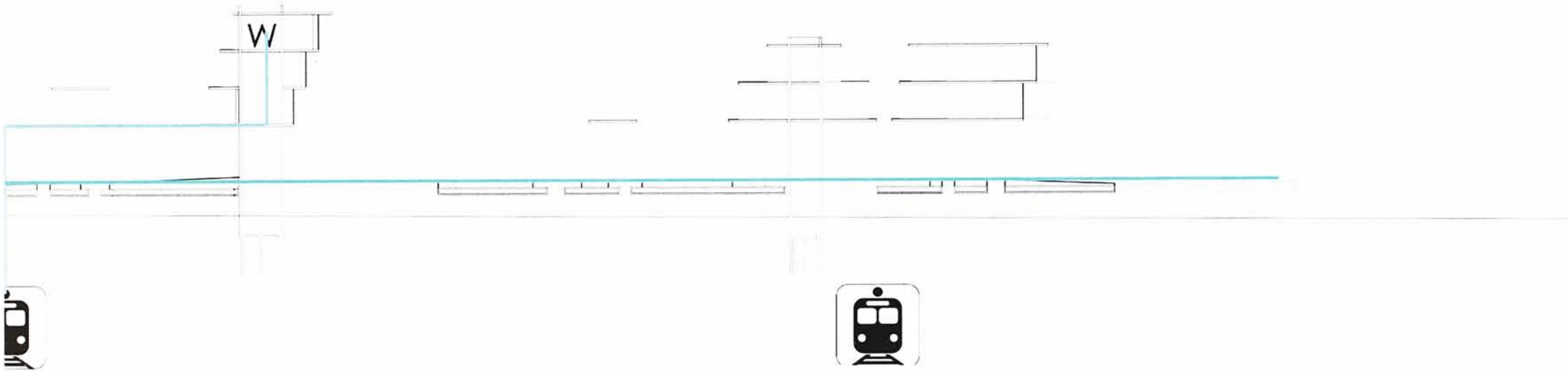
Wind Turbine
Grey & Black
Recycling Biogas

Public Space
Medical Facilities

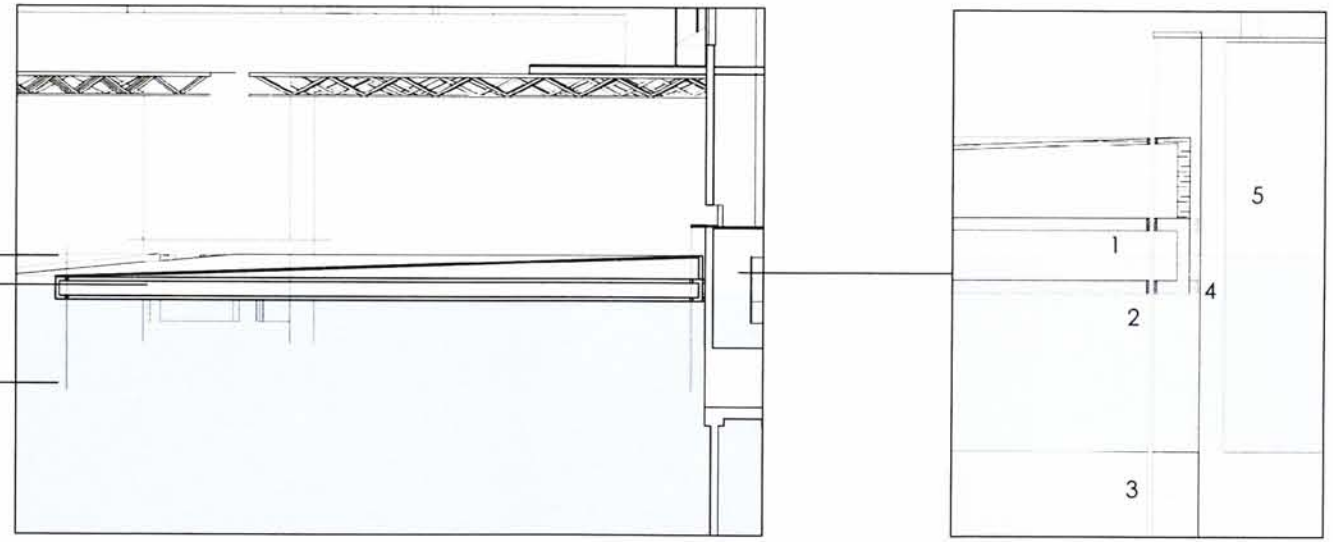
Greenery
Livestocks



Route 1

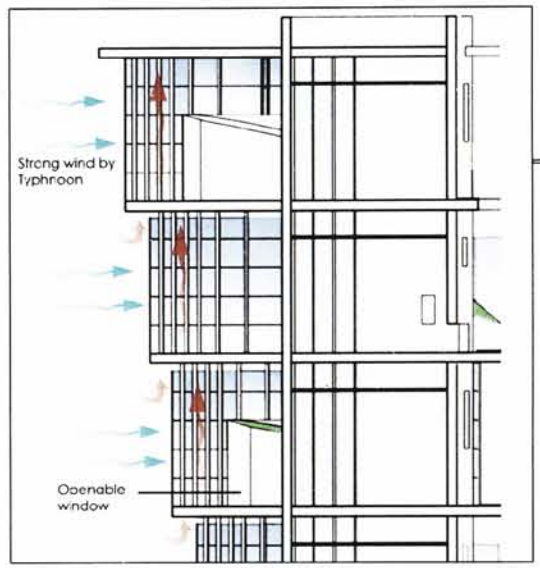


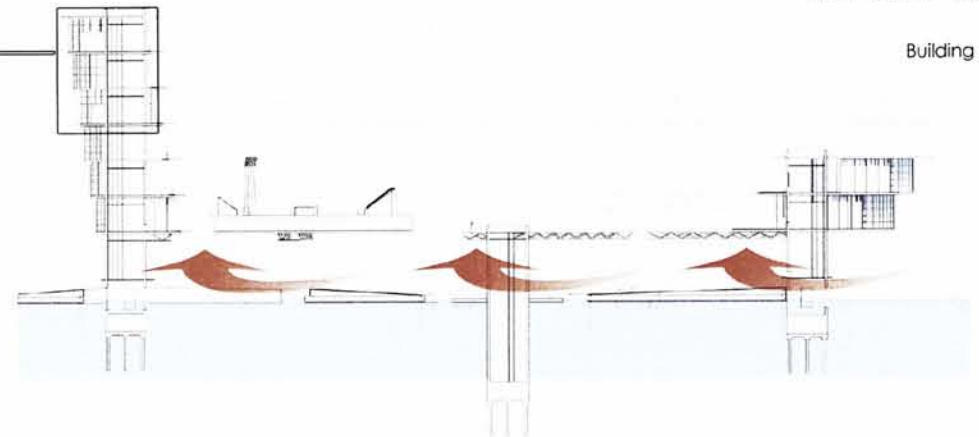
Detail of Floating Landscape

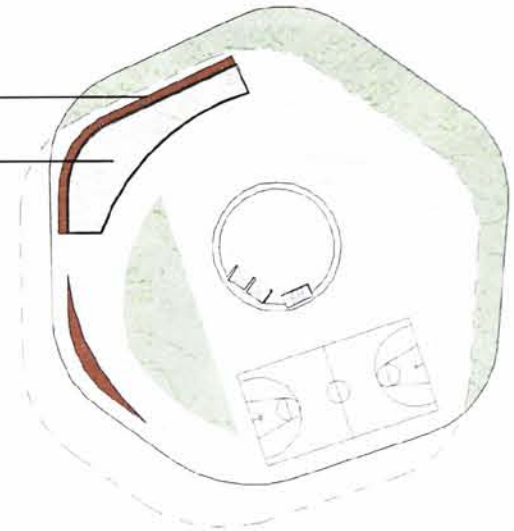


1 _ Floating material used in ship
2 _ Hole to allow the piles to move vertically
3 _ Piles inserted into sea bed
4 _ Wheel joint which allow the platform to rises vertically
5 _ Core concrete

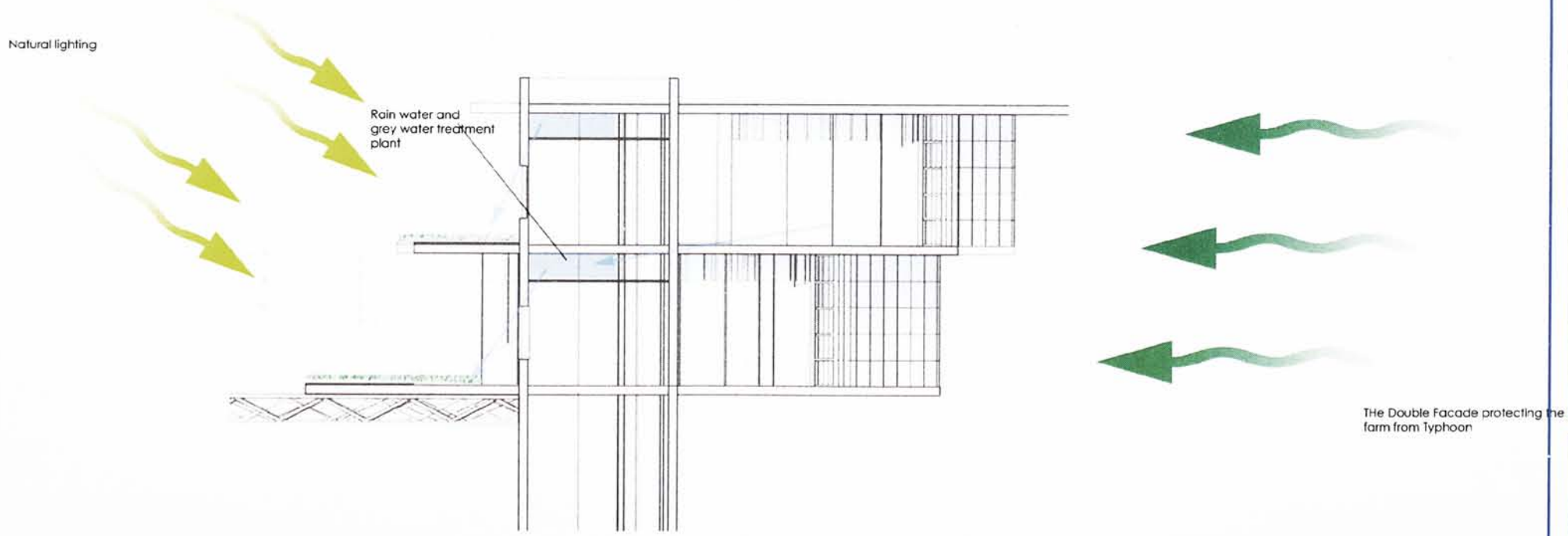
Vertical Ventilation + Wind Turbine



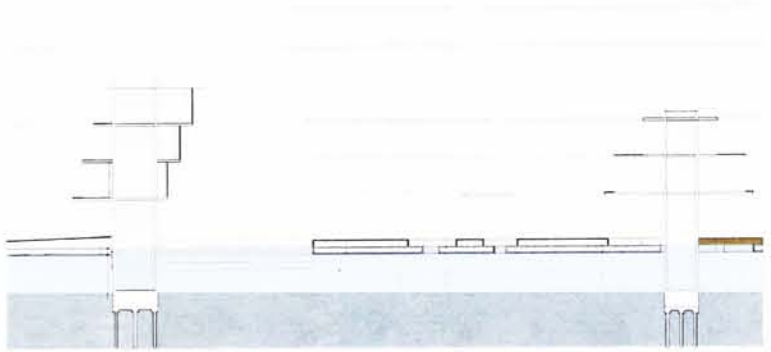




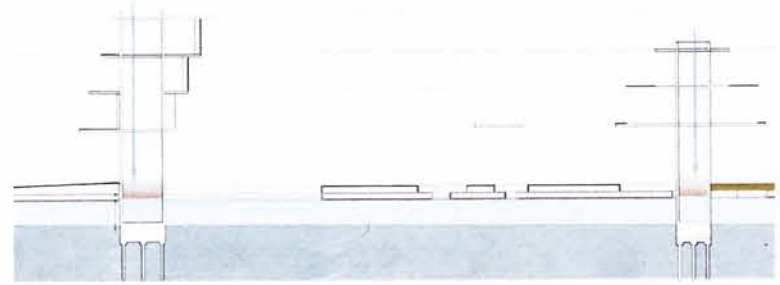
Detail of Floating Landscape

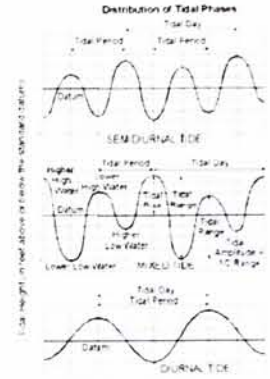


Tidal Energy



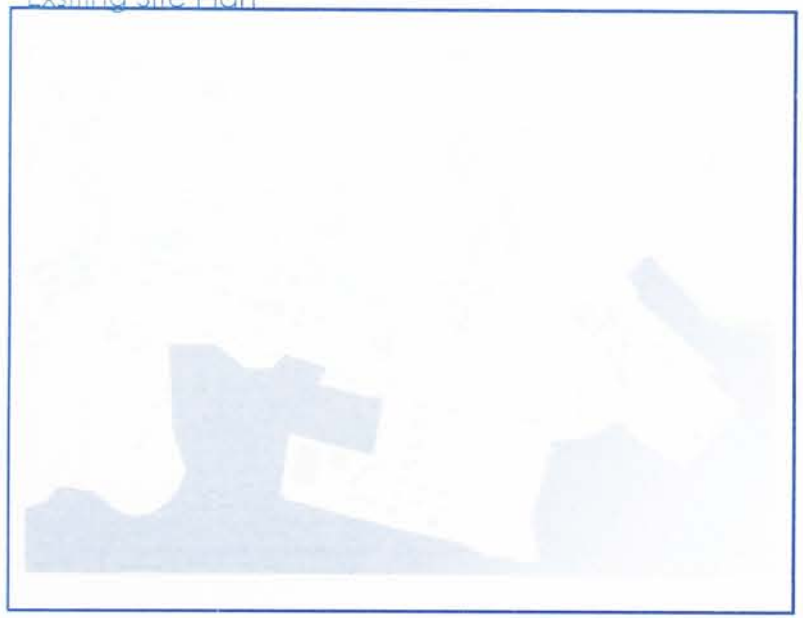
The Sea water level rises due to the tidal , the floating platform follow the water to rise.



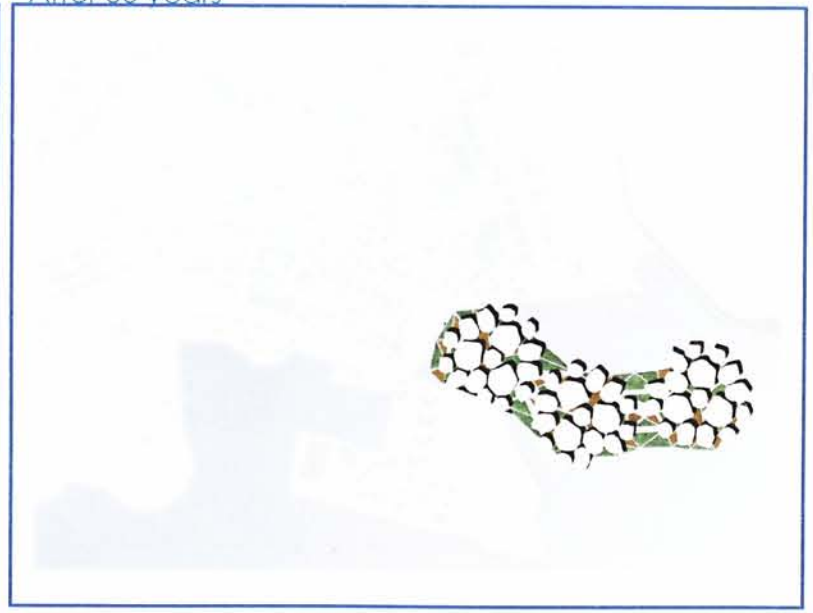


When The sea water level drop, the tube will store the sea water and let the water passing though the turbine, converting kinetiv energy into eletricity.

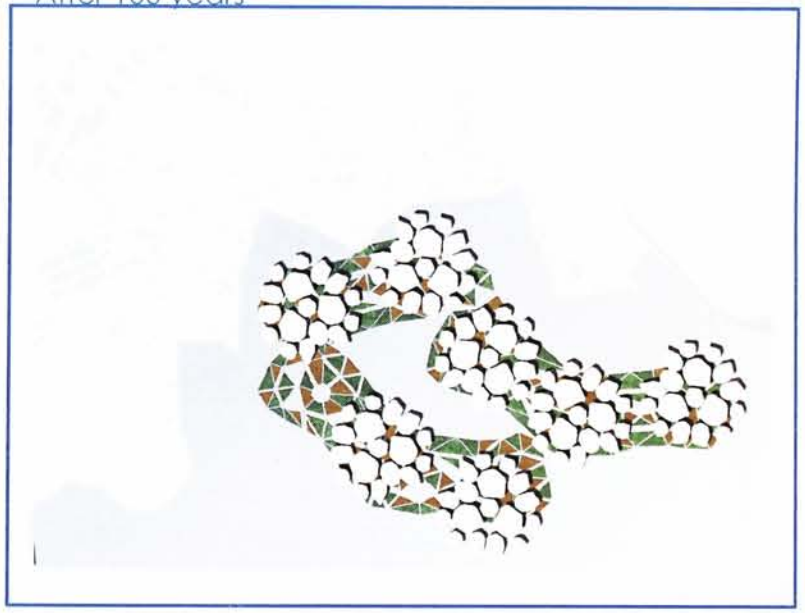
Exsiting Site Plan



After 50 years



After 100 years

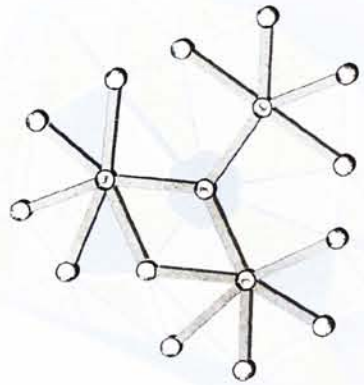


Proposed Site Plan with floating landcape

30m

13m

27m



45m

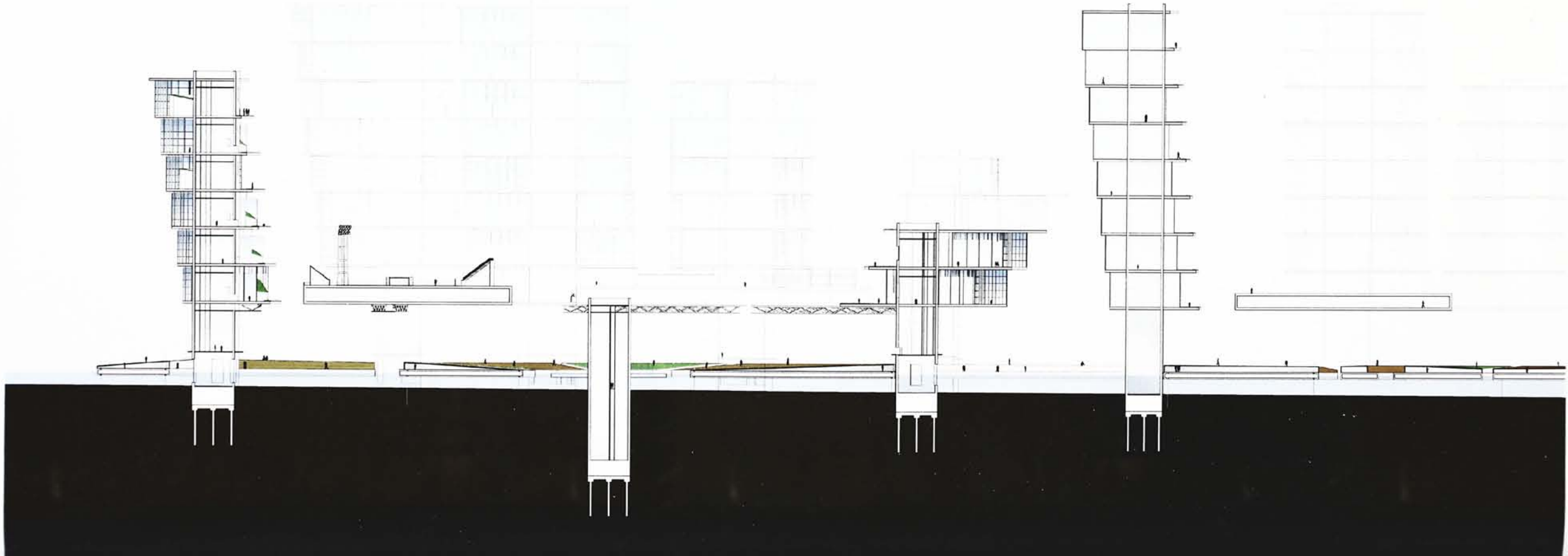
75m

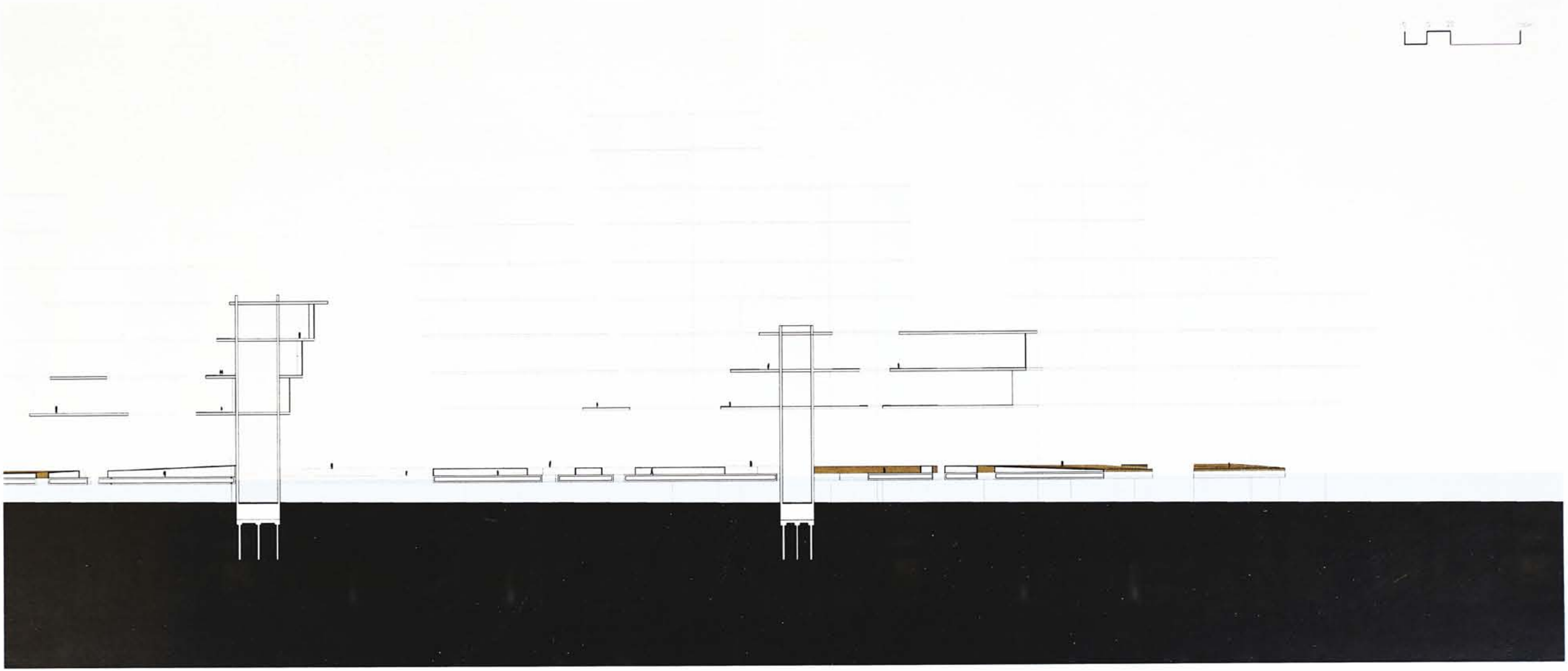
120m

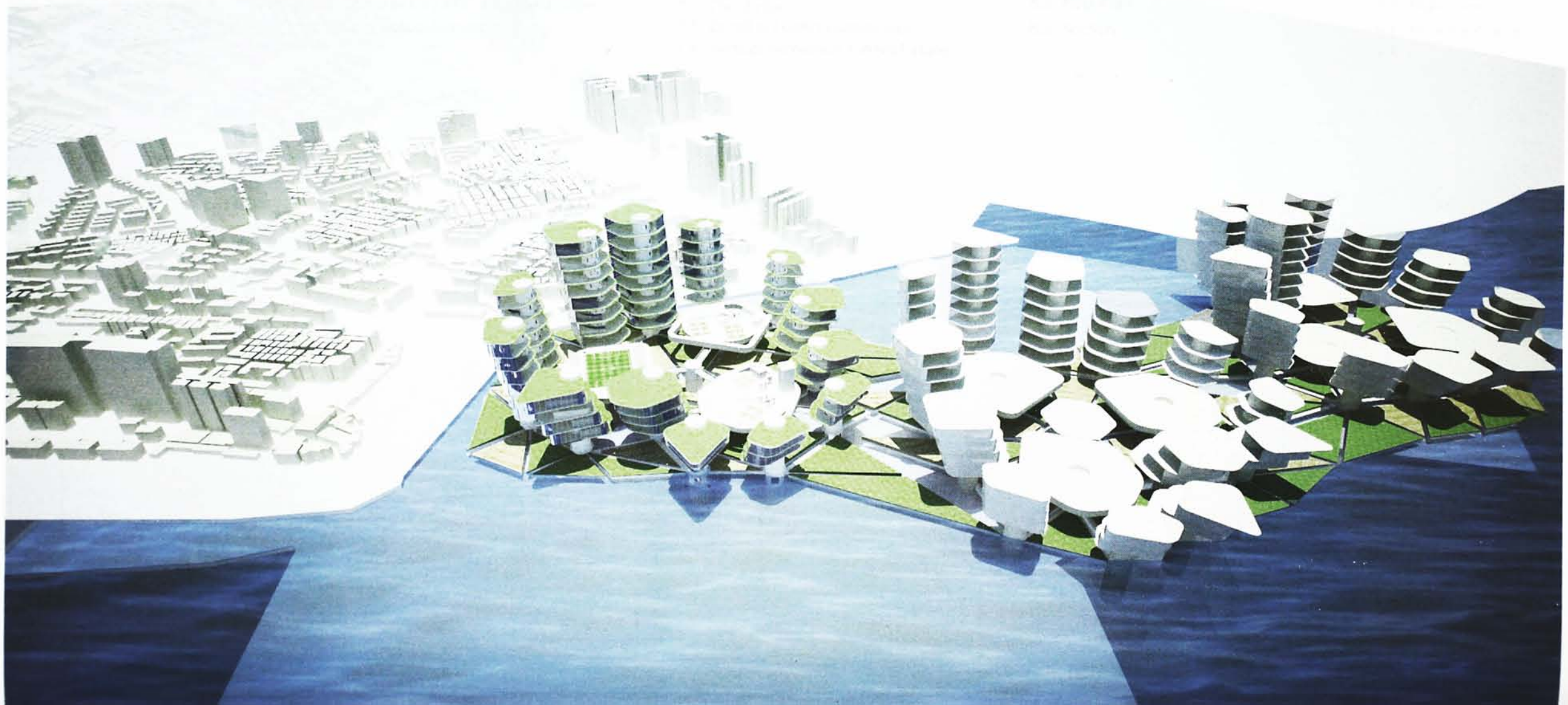
60m

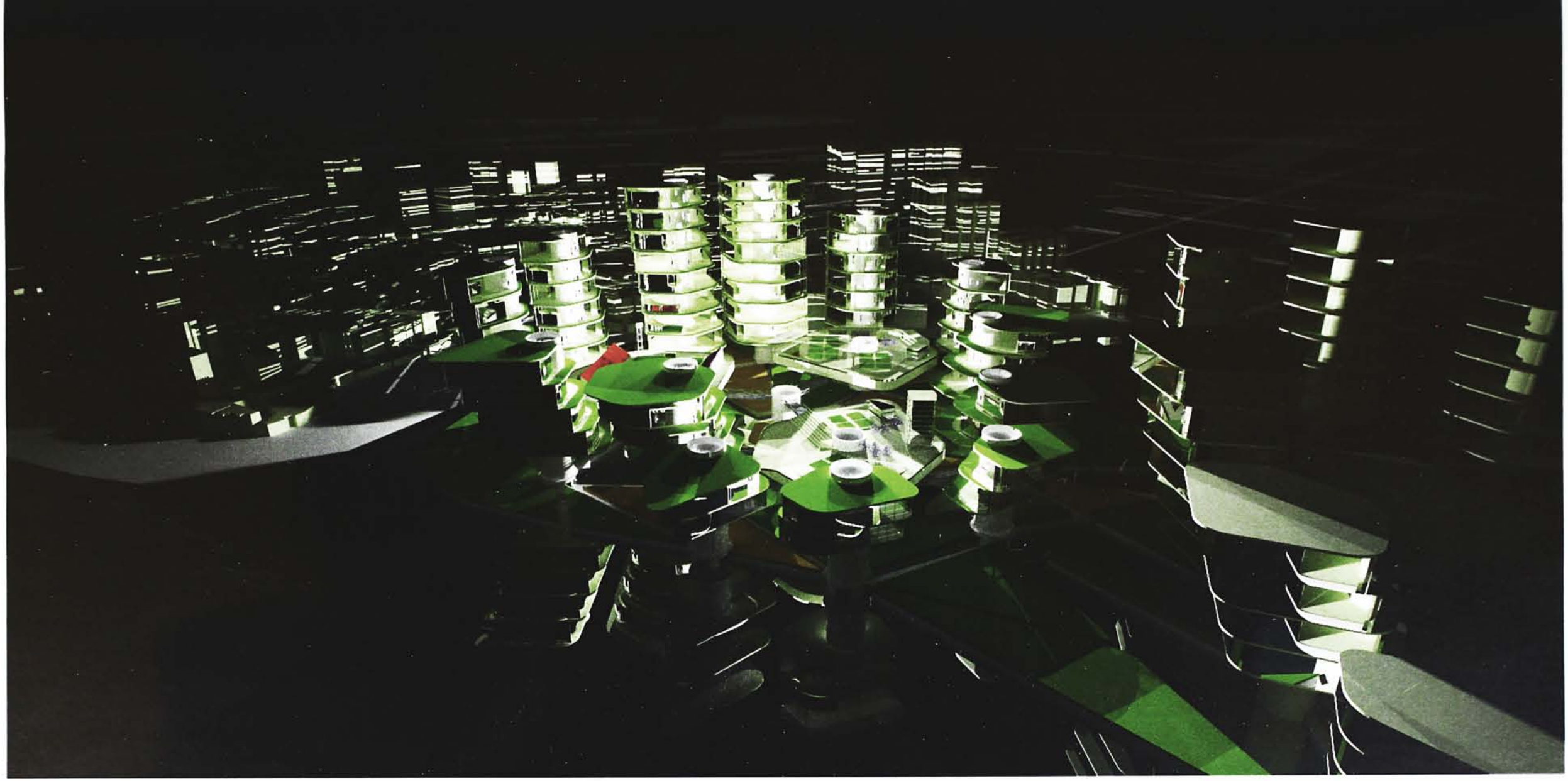
90m

8.3 Section










SUBWAY